COAL AGE

Vol. 11 NEW YORK, JANUARY 20, 1917 No. 3

The Business of Little Things

How It Works in Some Concerns:

THE president of a street railway company was at lunch with a friend who asked why he had refused to consider a bid from a certain coal corporation to furnish his yearly contract of several hundred thousand tons. "Because," the president answered, "that concern makes a business of little mean practices. Last year they announced a 15 per cent. raise for all employees. Only a few got that much and over half got less than ten. The public was fooled along with the men. A company that will not treat its men fairly isn't going to be any better to me."

A good man recently left one of the biggest and apparently best-managed companies in America. Over 20 years of his life had been given unsparingly in its interests. The reason: His superior was a man who in spite of ability and rare intelligence was unbearably little in many ways. He would delegate no authority to his assistant, who nevertheless was expected to make decisions for which he was invariably called to task. Gradually his enthusiasm was chilled, his initiative crushed and the fine spirit of loyalty killed. There was no alternative but to resign.

A manager noted for his gruffness and meanness of manner, one who believes that colored labor is best when paid least, was told last fall that some of his most competent negro miners were leaving for other fields. He said: "Let them all go. 'D——n' them, they're too well paid anyway."

They got wind of his remark, took him at his word and moved away in a special train provided by eager agents. His mine was closed for weeks while coal was worth $5 a ton at his tipple.

And How Different in Others:

A CUSTOMER threatened to cancel an important contract with a small operator because of slate in the coal. The contract was valuable and must not be lost. The operator knew that and he also knew his men did not intentionally mean to load dirty coal. So he did not attempt to bully them into loading clean coal or losing their jobs. He did a bigger and better thing. A notice was posted abolishing the penalty and offering a small bonus for every car containing a minimum of slate. The men went after that little bonus, the operator got clean coal and held his customer.

A number of mining companies recently raised the schedule of wages. It was a clean-cut increase too—no small methods were employed. The general public, too often inimical to corporations no matter how well managed, said, "Now watch house rent, commissary and powder prices go up." But they were fooled. Those concerns were honestly sharing unusual and unexpected profits with their men.

A manager stood on the main haulage-road and surveyed a wreck that stretched for a hundred yards—broken cars, smashed locomotives and all the rest. He knew it meant a shut-down for the rest of the day, and he knew somebody had been terribly careless. But he didn't "cuss" at the whole bunch as some managers do. He calmly said, "All right, boys, clean her up as soon as you can," and moved on out of the mine. Later he found who was at fault and that was the man he reprimanded.

Last summer there was a picnic at a southern coal-mine operation. All the miners and their families were there, including the entire colored contingent; for there was to be a barbecue. During the day one negro was heard to ask another: "How is it dese white folks of ourn invites all us niggers to dis picnic?" "Man, dat's easy," answered his colored buddy. "Our white folks don't do nothin' in no small way—ev'ything dey do, dey do's it big."

To starve a man's spirit by refusing to speak a word of encouragement and to deal squarely with him, is the mark of littleness. Every company has the choice of expressing itself in either a LITTLE or a BIG way.

Ideas and Suggestions

Colliery Research

By Canadian Engineer

The subject of coal research was touched on in a recent issue of *Coal Age,* when a short description was given of the results attained by one of the German coal-research bureaus.

It is instructive to inquire why it is that coal-mining research is so backward in the United States and in Great Britain. Apparently, two reasons can be cited: There does not seem to be much scope for the discovery of anything of practical value, and coal mining is looked upon as a mixture of other sciences. It is an industry that is carried on by the progress made in electricity, mechanics and chemistry, each of which sciences progresses upon its own momentum, as it were, and applies its results to coal mining—if they can be so applied. Coal mining is never looked upon as a possible field in which to make experiments that might, to reverse matters, be applied afterward to other things.

If we could take this subject of research into our own hands, our progress would surely be increased, since then we could devote all our time and energy to the solution of problems that could be tackled from the mining point of view. Working along this line, one of the English universities has recently established a department of research to be devoted solely to mining matters.

A glance at the research work of the large steel plants and other industries discloses that research work has been mainly concerned with means toward the better production of the manufactured product. That is, these industries are operations that convert a raw product into a marketable commodity by a process of manufacture. They do not sell a raw product. On the other hand, coal mining is an industry that does sell a raw product, generally without any after process of manufacture, so that present research in coal mining is mainly confined to one or two side issues—that convert coal from a raw material into manufactured products—such as the by-product coke industry, the manufacture of briquettes and the chemical side of coal-tar products. Otherwise, efficiency and safety cover the research that is applicable to all collieries at present. Still even in those two subjects there is much to be learned.

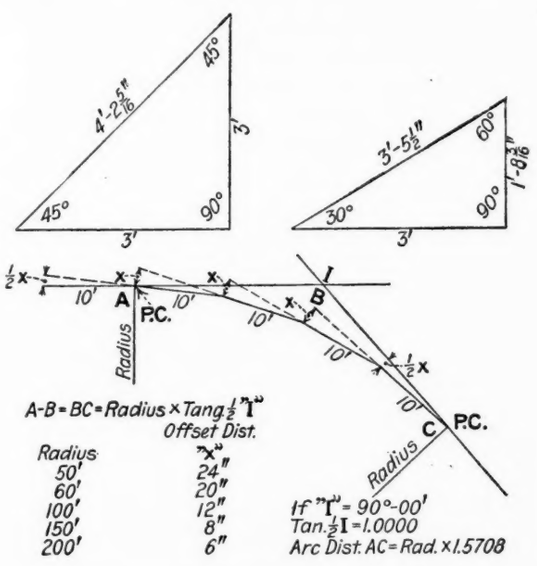
We cannot doubt, however, that the coming years will witness a revolution in our use of coal, knowing as we do the basic facts underlying the consumption of this fuel and the tremendous waste that takes place under our existing system of usage. Toward this end research will aid immensely, by pointing out ever more clearly just what this waste amounts to and indicating means whereby the same results that we now obtain can be got at by other methods that are not so wasteful, or that take care of the waste by the production of other useful products. It is in this direction that we should by every means available encourage coal research, and with research we should harness the forces of conservation, because the objects of the two are the same although the methods differ. The one aims to make a greater use of the raw product at our command, while the other tries to save that raw product as it is.

Coal-mine research is a bigger problem to the coal industry than research was to the steel maker. In the old days, the quality of steel was poor, and research showed the way to improve it. But research did not show the steel maker how to divide steel into other salable products. That is what it will have to do for the American coal mining companies.

Laying out Angles and Curves in Mine Work

By O. H. Hampsch*

Mine foremen, superintendents and engineers are often called upon to lay out many of the most commonly used angles and curves in mine layouts of various kinds. A very simple way to lay out angles without the use of the transit is shown in the accompanying drawings. The



METHOD OF LAYING OUT CURVES

methods of laying out 30-, 45-, 60- and 90-deg. angles as here shown are self-explanatory.

The method of laying out simple curves in mine work is as follows: After the point of curve *PC* has been determined, measure back a distance of 10 ft. and make an offset equal to one-half of the offset distance *X* in the direction the curve is to be driven. After driving ahead 10 ft. on these sights, set over distance *X* from the second point, or the *PC,* and drive ahead another 10 ft., mak-

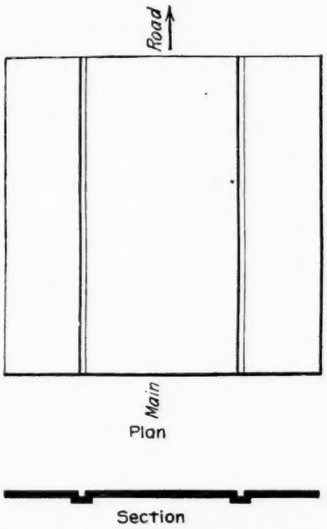
*Piney Fork, Ohio.

ing the offset the same as before. The first and last offsets are always equal to one-half the distance X.

Although other distances in proportion to the ones shown on the drawings can be used, the dimensions shown will be found most convenient. Ordinary sight strings or plumb bobs hung from spads are used for line.

Useful Underground Plates

A number of places frequently exist in and about mines where plates can be laid down instead of points and crossings and serve the purpose with equal satisfaction and in some circumstances suit the conditions even better.



PLAN AND SECTION OF PLATE NO. 1

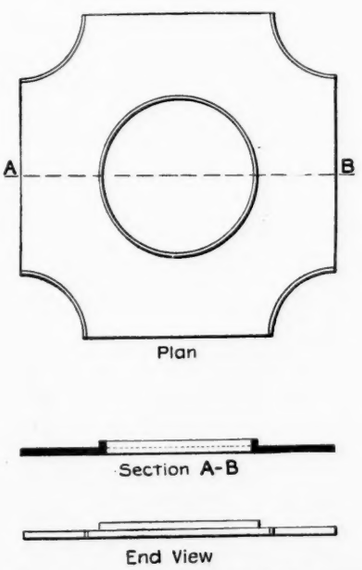


PLATE NO. 2 ADAPTED TO HORSE HAULAGE

Commonly, such platforms are built of separate sections laid down between the rails and one on either side of each rail. This means a good deal of time and trouble in laying and staying in position, although it has the advantage that the line of rails does not need to be disturbed when the plates are removed elsewhere. The accompanying illustrations show two plates that are in common use in some districts. They are single pieces of plate designed to be lifted complete and to do the work of the turn out in more limited space.

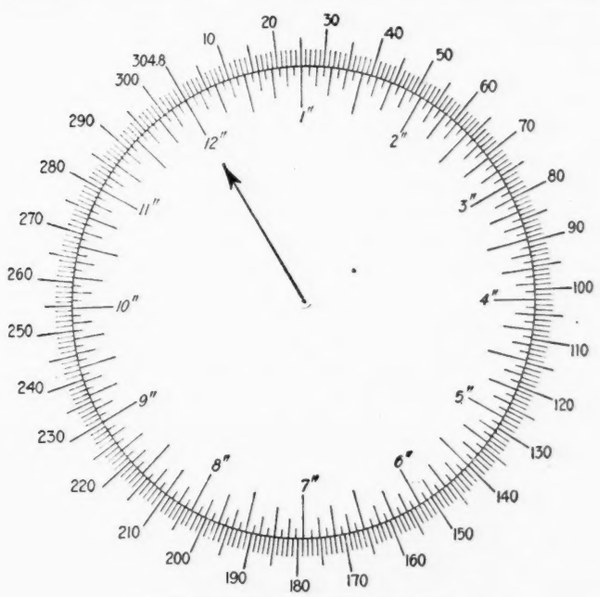
Plate No. 1 is laid with its surface level with the top of the rails, a groove being cast along the plate in the direction of the main traveling road, in which the flanges of the wheels run. There is no flange groove in the direction of the side road, and the side-road rails are slightly above the level of the plate.

In coming off the side road, the car is swung around as it touches the plate, and if this is skillfully done its own momentum carries it over the plate and allows it to slide into the tracks in the plate which act as a stop. This operation can be performed almost without appreciably affecting the forward movement of the car.

Plate No. 2 is a type that is useful where horse haulage is employed as it provides a space into which a horse can step instead of depending for footing upon the surface of a slippery plate. The raised edges in the center and outside corners form practically a turntable and provide the means whereby swinging the car upon the plate is easy of accomplishment.

Handy Metric Conversion Charts

To reduce delay in transforming inches into the metric system a conversion chart has been devised, as shown in the accompanying illustration, which is a model of convenience and is recommended to all concerned. This one is for inches up to 1 ft., but similar charts could be made for feet, yards, miles, units of area, ounces, pounds, pints, quarts, gallons, etc. A collection of such conversion



METRIC CONVERSION CHART

charts could be carried in a little leather case, to be slung over the shoulder, not much bigger than an 8x10 camera and would not weigh much over 10 lb. and would render the compulsory use of the metric system just as simple as anything—Or is this too subtle?

A Fairly Satisfactory Emergency Rail Bond can be made from a piece of 00 wire twice as long as the fishplate. This should be doubled in the middle and bolted fast to the rail under the fishplate. Such a bond is said to give better results than the channel-pin bond and always remains in place.

Coal Cutting in Western Kentucky Mines*

By H. M. Ernst†

SYNOPSIS—The average tonnage undercut at some western Kentucky mines with shortwall machines is 150 and 250 tons per machine-shift. From 2500 to 3000 bits are sharpened per day by one man and a boy. From 0.75 to 1.5 bit sharpenings per ton are needed. One bit on an average undercuts 35 tons of coal. These last figures are for the West Kentucky Coal Co.'s mines. Its bonus system to reduce repair costs to a minimum is explained.

The West Kentucky Coal Co. owns nine mines in Union and Webster Counties in the western end of that state. Eight of these mines are in operation at the present time; four in the No. 9 seam, which is 4 ft. 7 in. to 4 ft. 10 in. thick. It has a black slate top, a hard fireclay bottom and no partings. There are two mines in the No. 11 seam, which in this field is 5 ft. thick with a limestone and soft shale top, a fireclay bottom and a 2-in. slate parting 22 in. from the floor. There are also two mines in the No. 12 seam ranging from 5 to 8½ ft. in thickness. This seam has a soapstone top, no partings and a very low percentage of sulphur.

The rooms in No. 9 seam are made 300 ft. long and 30 ft. wide, two loading tracks being laid in each room. The entries and crosscuts are 12 and 10 ft. wide respectively. Rooms in the No. 11 and No. 12 seams are driven 21 to 26 ft. wide with entries and crosscuts as above. The normal pitch of these three seams is from 4 to 6 per cent., but in some cases there are local dips having a grade as much as 20 per cent.

The method of mining is a combination of the cross-entry, room-and-pillar and panel-entry systems; up to the present time no pillars have been drawn, but in a new opening under 400 ft. of cover a semi-longwall projection is in process of development where it is hoped that practically all the pillars can be successfully drawn.

*Paper read before the Kentucky Mining Institute on Dec. 8, 1916, and entitled "Result Obtained with Mining Machines in the West Kentucky Coal Co.'s Mines."

†Mine superintendent, Nos. 1 and 2 mines, West Kentucky Coal Co., Sturgis, Ky.

When the West Kentucky Coal Co. first purchased this property only four mines were in operation; the coal was mined with punchers or shot from the solid; a little later a few breast machines were tried out with only moderate success.

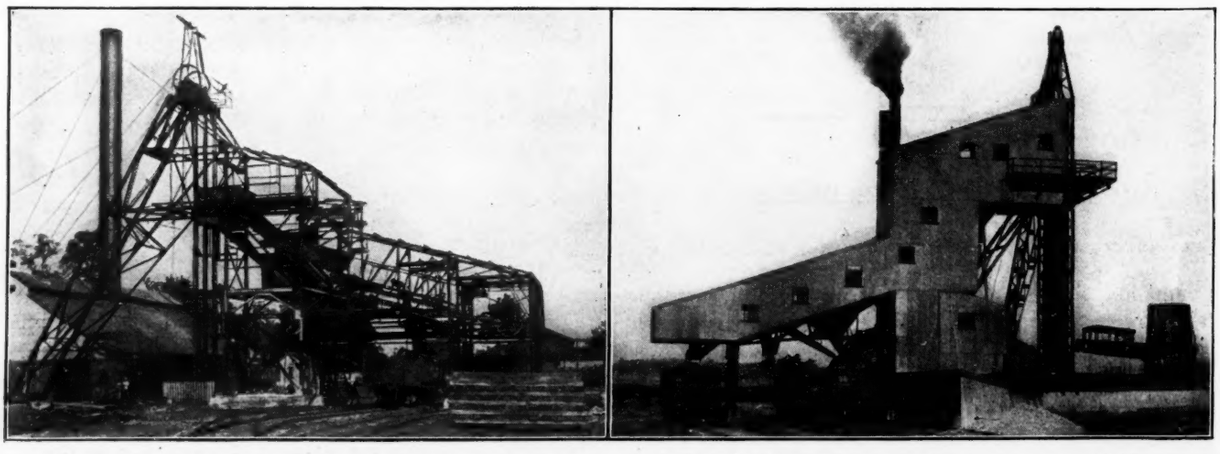
About 11 years ago nine Sullivan shortwall machines were put in service, and this number has been gradually increased until there are in use at the present time 45 machines. All the coal mined by this company is undercut with equipment of this type. It is neither feasible nor necessary to describe these machines in detail as practically every man connected with the coal industry is more or less familiar with their operation.

The type used is known as the C. E. shortwall with a vertical shunt-wound motor, rated at 30 hp. when supplied with current at 250 volts. With two exceptions, the machines are all equipped with 6½-ft. cutter bars and a 15-in. feed. Two machines recently purchased have the 7½-ft. cutter bar and are being used in the No. 12 seam, which is practically free from impurities and is a much easier cutting coal than either No. 9 or No. 11. I believe that the longer bar will be a distinct success in this seam and that the production per pound of powder will be materially increased.

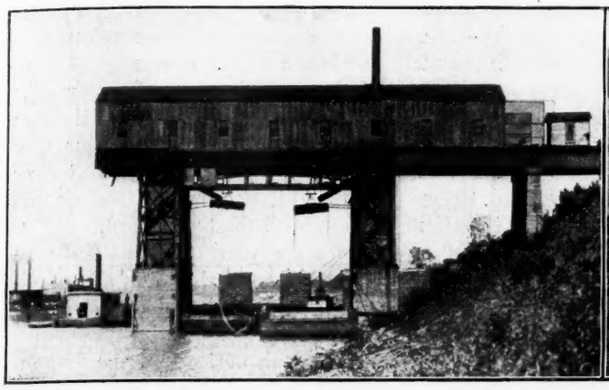
Machine Bit and Feed Problems in Kentucky

Experience has demonstrated that the 15-in. feed is best adapted for No. 9 and No. 11 seams in the mines of the West Kentucky Coal Co., on account of the hardness of the coal and the presence of small pyritiferous and other rock bodies often encountered near the bottom of the seam.

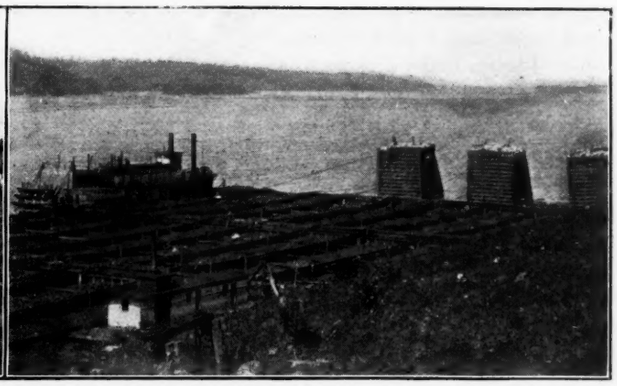
The bit question is the first important problem to be solved in connection with the operation of this machine, for the bit is to the mining machine what the tooth is to the crosscut saw. When this machine was first introduced into this field, chisel-point bits were used in connection with up and down pick points. The sharpening of these three classes of bits and their distribution to the different machines were found quite difficult of accomplishment. The Sullivan Machinery Co. recognized the difficulty and instead of the old 5-position chain introduced the 9-position superdreadnought which is now used.



STEEL TIPPLE OF WEST KENTUCKY COAL CO. AT NO. 8 MINE, STURGIS, UNION COUNTY, KENTUCKY
Left—A few days before completion. Right—As it appears in operation



TIPPLE OF WEST KENTUCKY COAL CO. AT CASEYVILLE, KY., ON THE OHIO RIVER



A LOADED FLEET OF WEST KENTUCKY COAL BARGES AT CASEYVILLE

Straight pick-point bits in this chain give a good clean kerf, making comparatively coarse machine cuttings, while placing on the machine only a moderate load.

Formerly all bits were sharpened by hand, a slow and expensive process. Four years ago several small trip hammers were installed and these have done more than any other one thing to ease bit troubles. One man, with a boy to heat the bits, can sharpen 2500 to 3000 bits per day, making on an average a better bit than a man will make without the hammer, because a blacksmith sharpening by hand will endeavor to get the bits as hot as possible so as to save hammering. In doing this he not only makes a badly tempered bit but burns away valuable bit material.

Temper Machine Bits in Boiling Soap Water

The die used in these hammers is a home product that has been found superior to anything on the market and that can be made for $20 per set. After trying out a number of tempering compounds I have found that a solution of cheap laundry soap and soft water gives good results at little expense. One cake of soap is used to 25 gal. of water, washing powder being added where the water is too hard to lather freely.

At the beginning of the shift this mixture is heated to the boiling point, and the sharpened bits while at a cherry-red heat are thrown into the tempering tub, the hot bits keeping the mixture boiling, insuring a slowly cooled and evenly tempered bit. The object is to furnish each machine with plenty of bits and thus encourage the runner to change them before they become dull enough to load the machine, believing that it is cheaper to sharpen bits frequently than to keep them dull, thus burning out armatures and wearing out cutter chains.

In the No. 9 and No. 11 seams approximately 150 sharp bits are used to cut 100 tons of coal, while in the No. 12 seam the tonnage per bit is more than doubled. To many this tonnage per bit sharpened will seem low, but when you consider that 150 bits are often dulled in one room where rock or heavy sulphur bands are encountered, you will readily see the cause. In spite of the low tonnage per bit sharpened the past three years have shown a production of 35,000 tons of coal per 1000 bits purchased.

How Much a Mining Machine Will Undercut

In discussing production per machine, I am going to use some figures that have come to me from other sources as well as those based on observation. The tonnage produced per machine of a given feed varies greatly, due to several factors such as the thickness of the coal, its hardness, the width of the working places and the length of the transfers.

My company produces approximately 150 tons per machine per shift. This figure is an average for the three seams, quite a number of machines being used on development or on practically worked-out runs. Such equipment is kept busy only a part of the time.

One mine in the No. 12 seam is producing 200 tons per machine-shift. The record cut in the No. 9 seam for the West Kentucky mines is 300 ft. in 9 hr.

Since starting this paper I have had the pleasure of spending a day in the Graham mine of the W. G. Duncan Coal Co., where five of these machines have recently been installed. This company is producing nearly 250 tons per machine-shift, which I consider a remarkable evidence of efficient management.

Though the coal seam mined is No. 9, it is of such a nature that they are able to use a 25-in. feed over a

VILLAGE OF WEST KENTUCKY COAL CO. AT NO. 1 MINE, STURGIS, KY.

6½-ft. cutter bar or a 21-in. feed over a 7½-ft. bar; they are also getting a good tonnage per bit sharpened, all of which factors make a large production per machine possible.

The maintenance cost is probably the most important item in connection with the mining machine, and especially at the present time when cost of material of all kinds is at high-water mark. The successful and economical operation of a mining machine, like any other piece of machinery, depends largely on the human element. By using care in selecting hostlers who will later become runners, an efficient machine organization can be built up. I know of an instance where one man operated a machine continuously for four years without once calling on the machine boss except occasionally to ask for some small repair part to replace one not broken but actually worn out.

Unfortunately, men of this type are not numerous, and for the average runner some incentive is necessary to sufficiently interest him in getting the best results from his machine. I find that the easiest way to reach a man's mind is through his pocketbook. Realizing this, the West Kentucky Coal Co. last June established the bonus or premium system for mining-machine and repairmen.

A large number of writers are now getting out literature discussing the bonus system, one side claiming that it is the panacea for all labor troubles, while its opponents maintain that it is impractical and cannot be used around a coal mine.

Bonus System as Applied to Repairs

The mines of the West Kentucky Coal Co. naturally divide themselves into three divisions: The Sturgis division with four mines, and the Clay and Wheatcroft divisions, each with two mines. A general supply stock is kept at each division and all supplies as purchased are charged to this supply account. One machine boss has charge of the machines and other electrical equipment in use at each division, with one or more helpers as conditions may require.

All supplies are issued by either the machine boss or his helper and charged to the mining-machine account of the mine where used. The average maintenance cost for the year 1915 was taken as a standard.

The maintenance cost per ton mined for the year, including the month for which the bonus is to be figured, is subtracted from the standard described above. This difference, multiplied by the tonnage of the month, is divided equally between the company and the machine- and repairmen.

It can readily be seen that in this way the men can make a gradually increasing bonus, and this they have succeeded in doing. At the same time it is impossible by skillful manipulation of supplies on the part of machine- and repairmen to show a large premium in one month followed by a high maintenance cost and no premium the succeeding month, which could be arranged were each month figured separately.

As an example, to show how this premium system works out: A mine having a machine maintenance-cost standard of 2¼c. per ton, determined as above, produces in a given month 20,000 tons. The cost per ton for the year, including the month in question, is 1½c., making a net saving on the tonnage of the month of $150, which is divided as follows: $75 to the company and $75 among five machine runners, five hostlers and one repairman, in proportion to their earnings for that month.

The system, while it has only been in effect for a few months, bids fair to be a distinct success. For the most part the men engaged in the operation of the machines have taken unusual interest in reducing maintenance costs, and the men at the different mines rival one another in the attempt to establish the best record.

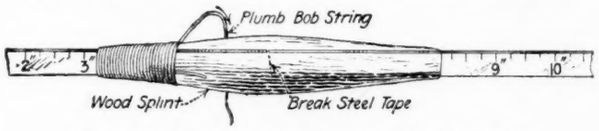
The cost of supplies for the year 1915 was 0.96c. per ton. This includes bits, bit boxes, cables and all supplies used in the operation of machines, but does not include depreciation.

In this connection it is worth notice that the first machine purchased has been in continuous service for 11 years and is today in as good operative condition as one just out of the factory.

Field Mend for Steel Tape

Hale H. Hunner, of Hibbing, Minn., says in a recent issue of the *Engineering and Mining Journal:*

Although there are several quick-repair menders for steel tapes on the market, it usually happens that they are in the office when the tape breaks. I was taught this simple mend by a practical surveyor several years ago, and



MENDING A TAPE WITH WOOD AND STRING

have used it a good many times since and never had the least bit of trouble in making it hold as long as I cared to leave it on. I have worked for a week in the woods with two of them on the tape and they needed no attention other than an occasional soaking.

When the tape breaks, cut a straight piece from a green alder or willow about 3 in. long. When the stick is split down the center and peeled, it should just cover the tape laid lengthwise. Smooth up the split faces and shave down the outside from the center of each half to a thin edge. About 3 ft. of plumb-bob string or stout cord will serve to wrap the splints. The cord should be wrapped as tight as possible each time and care taken to see that the binding does not have a chance to slacken up. When the splint is nearly half wound, place the broken ends together right side up and finish winding until the splint is entirely covered. A minute's soaking in water will remove any possibility of slipping. If it should slip at all, it will pull entirely out, thus there is very little chance of getting wrong chainage. The mended portion slides readily through the brush and around rocks.

Rights Under Coal-Mine Leases—Although a mining lease authorizes the lessee to maintain houses on the surface for his employees, he may not unnecessarily interfere with the lessor's reserved right to use for agricultural purposes that part of the surface not necessary for mining, by placing houses thereon, merely because it is more convenient to the lessee to place them there. But right reserved to the lessee to mine adjacent lands includes the right to maintain houses on the surface for use of employees engaged in mining such lands. And the lessors are not entitled to pollute an adjacent stream used by the lessee as a water-supply for the mine boilers. Right given the lessee to cut timber for mining purposes implies a convenient right-of-way to reach and remove the timber. (Kentucky Court of Appeals, Blue Grass Coal Co. vs. Combs, 182 Southwestern Reporter, 207.)

An Accounting System for Coal Mines—I*

By R. J. Maxwell†

SYNOPSIS—Description of a simple and effective system of accounting that will cover all necessary requirements. The method has been devised with special reference to the needs of coal-mining companies.

Of late years many articles have appeared, dealing with the subject of cost and accounting methods and systems. Most of these articles urge the necessity of paying more attention to the cost and accounting end of the business, and dangle before the eyes of executives the great benefits that accrue from the more intimate knowledge obtained of the cost of production. The majority of executives admit their belief that the subject deserves considerably more thought and attention than it receives, but are either frightened at the thought of the initial outlay, or, being practical coal operators and not accountants, do not know how to go about the introduction of the new methods and so allow the whole thing to slide.

The terms "Cost System," "Accounting System," "Cost-Accounting System," etc., are unfortunately associated in the minds of many practical men with annoying red tape, a large office force, a deluge of nicely ruled forms, and consequent high printing bills. I believe this attitude is owing to the fact that there has arisen a great demand for systematizing accountants and many auditors and accountants, utterly unfitted for this work, not having any knowledge or training in factory and workshop practice, have tried to meet this demand, and having drawn up a series of forms, have endeavored to fit them to all classes of business.

Under these circumstances there was naturally a high percentage of failures, and managers were faced by the problem of either putting in an elaborate and expensive system (which might prove a failure) or none at all. Here I may say that a system to be efficient must be simple and easily understood by every person who has any connection with it, and it must be economical or it defeats its own purpose, which is to obtain the maximum amount of expense-saving information at a minimum cost. It is the object of this paper to lay before practical coal operators, as simply and lucidly as the writer knows how, a more or less complete system of accounts, showing the method of obtaining costs, and their correlation with the general books of account, and one which will fill the bill as regards economy of operation.

Chart Showing Distribution of Accounts

As a starting point a chart of the accounts of the company is a useful thing to have, as occasional reference to it will enable the general manager to keep in mind the various channels through which the data have to go, which are submitted to him in finished form, and also serves to give each member of the staff an intelligent conception of the purpose served by his individual work. This is important, as work done mechanically by, a subordinate and without a proper conception of the use made of the figures he produces, is very likely to be inaccurate; on the other hand, a knowledge of the final use made of his work will probably engender a lively interest, which will increase his efficiency and enable him to produce more accurate work, and result in the more economical administration of his department.

Fig. 1 presents an outline of such a chart. It is divided into the two main divisions of "Assets" and "Liabilities." The chart should be laid out by the chief accountant in consultation with the general manager and superintendent, when such controlling items as "Production Account" can be subdivided into as many subsidiary accounts as the management may desire.

The next step will be to lay out the various cost data required. Fig. 2 is an example of a simple cost sheet that shows the total coal produced, the number of days worked, the total cost of labor and material by departments, cost per ton by departments, and the average cost per ton over all each month. With the exception of such items as "Depreciation," "Insurance," "Taxes," etc., the mine superintendent is responsible for the figures produced on this sheet, and should therefore go very carefully into the matter of subdivisions required and closely scrutinize the various items each month. In this connection it would be well for him to see that the persons responsible for the "Daily Time Reports" and "Material Requisitions" have a clear idea of the various cost accounts, and that the terms used shall be standard, thus insuring that each item shall always be charged to the correct account and true comparisons maintained.

Properly handled the cost sheet will show the actual cost of production for the month, but the progressive manager will not be content with obtaining costs monthly and will desire to know each day how much his departments are costing.

This brings us to the "Daily Cost Sheet," Fig. 3. This sheet differs from the monthly one in several respects; material items are not charged to specific accounts but are assembled in the summary under the heading of "Supplies," the various classes of labor are given in more detail, and monthly salaries and such items as insurance and taxes are given under the heading of "Overhead Expense." Naturally a daily cost must be an approximation, but a careful analysis and distribution of the monthly charges is all that is needed to make it a very close approximation, which is all that most men ask for.

The coal production for the day is obtained from the flow sheet or tonnage report sent in to the office each day by the tipple weighman. The labor amounts are filled in by the timekeeper and turned in to the office each day along with his "Daily Time Report." The cost per ton by departments, and the summary are made out by the office and turned over to the superintendent.

Comparatively very few forms will be required to operate the system, the principal ones being a "Daily Time Report," "Material Requisitions," "Contract Sheet," "Individual Pay Sheet," "Pay Roll Sheet," and "Wages and Material Distribution Sheet," samples of which will be shown in the concluding article. Such forms as are required to report the daily progress of the mine need not be considered here as they are largely statistical and have

*From the "Canadian Mining Institute Bulletin."

†Pocahontas, Alberta, Canada.

FIG. 1. CHART OF ACCOUNTS

- Assets:
  - Cash on Hand
  - Imprest Cash Fund
  - Bank
  - Notes Receivable
  - Accounts Receivable
  - Buildings and Equipment
    - Tipple Building
    - Tipple Equipment
    - Power House Building
    - Power House Equipment
    - Camp Buildings
    - Horses
    - Mine Cars
    - Coal Cutting Machinery, etc.
  - Townsite
    - Cottages
    - Water Supply
    - Roads and Grading
    - Electric Wiring
  - Mine Supplies
  - Mine Timber
  - Lumber, etc.
    - Inventory Accounts
  - Mining Operations, Outside Expenses
    - Tipple Expense
      - Weighman
      - Tipplemen
      - Box Car Loaders
      - Picking Table
    - Stable Expense
      - Labor
      - Feed
      - Harness
      - Sundries
      - Repairs to Wagons
    - Water-Supply
    - Repairs Outside
      - Buildings
      - Power House Equipment
      - Tipple Equipment
      - Outside Tracks
    - General Expense
      - Miscellaneous Outside
      - Shops
      - Teaming
      - Generating Power
    - Management
      - Superintendence
      - Mine Clerks
      - Mining Engineers
      - Office Expense
    - Royalties
    - Rentals
    - Taxes
    - Insurance, Fire
    - Insurance, Liability
    - Depreciation
  - Mining Operations, Inside Expenses
    - Airways and Gangways
      - Chutes
      - Tracks
      - Yardage
    - Mining
      - Rooms and Narrow Work
      - Pillar Work
      - Yardage
    - Timbers and Props
      - Round Timbers
      - Split Timbers Lagging
      - Putting in Place
      - Timber Packers
    - Ventilation
      - Fan Engineers
      - Firebosses and Shot Lighters
      - Brattice Work, Labor and Material
      - Lamps
      - Trappers
    - Haulage
      - Chute Loaders
      - Car Checkers
      - Drivers and Runners
      - Engineers and Rope Riders
      - Oil and Oiling
    - Pumping
      - Pumpmen
      - Pipes and Fittings
      - Repairs to Pumps
      - Pumpways and Pumps
    - Repairs Inside
      - Coal-Cutting Machinery
      - Tracks
      - Gangways and Airways
      - Mine Cars
      - Shafts and Slopes
      - Power Line
    - General Expense
      - Miscellaneous Inside
      - Pit Bosses
      - Wash House
    - Mining Operations Extraordinary Expenses
  - Suspense
    - Rentals Unexpired
    - Fire Insurance, unexpired
    - Advertising, Catalogs
  - Wages Paid in Advance
  - Timber Limit
  - Mining Rights, etc.
- Liabilities:
  - Accounts Payable
  - Accrued Wages and Salaries
  - Reserves
    - Depreciation
    - Taxes
  - Miscellaneous Liabilities
  - Capital Stock
  - Profit and Loss
  - Surplus

little or no connection with the accounting system. The principal books required will be Sales Books, Customer's Ledger, Invoice Register, Purchase Ledger, Cash Book, Journal, Production Ledger and General Ledger.

Preliminary Considerations

At the outset a careful inventory should be taken, and as carefully priced, extended and distributed to accounts, plant and equipment accounts segregated, and percentage of depreciation fixed on each, the amounts of such items as insurance, taxes, rentals, etc., determined and a monthly pro rata fixed. Controlling accounts should be opened in the general ledger for "Accounts Receivable," "Accounts Payable," and "Production," the balance in each of these accounts representing the accumulated balance of the individual accounts in the customers, purchase, and production ledgers respectively.

These accounts are valuable in that they permit the proprietor to find out at a few minutes' notice the total amount owing to him by customers, the total amount owed by him to purchase creditors, and the total cost of production to date. They also assist greatly in determining where errors in posting (if any) have occurred during the month.

Suspense accounts should be opened for such items as insurance and rentals, which are paid in advance. One-twelfth of the amount of each is credited each month to "Suspense Account" and "Production Account" debited, thus distributing the total amount equitably over the whole year. "Reserve Accounts" should be opened for depreciation, taxes, or any other items that are paid in arrears. One-twelfth of the amount is charged each month to "Production" and credited to "Reserves," "Reserve Accounts" being charged and "Bank" credited when actual payment is made. By this means the expenditure is anticipated and distributed equitably over the whole year.

Having entered our balances we are in a position to start work, and we will therefore revert to the "Chart of Accounts" and take up each one in detail.

Cash Account

The type of cash book in general use is one in which the "Dr." side is used to record the receipts and the "Cr." side to record the disbursements. However, I have used for many years, and strongly recommend, two separate books—one for receipts and the other for disbursements. This method has several advantages over the single type of cash book, the principal ones being first its simplicity of operation and consequent reduction of liability to errors, and second, the fact that it cuts out all waste space, every line in each book being utilized. The cash receipts book would be ruled as follows:

Date	Dr. Cash Received	From Whom Received	Particulars	Folio	Cr. Accts Rec.	Cr. S'dry Acc't

Postings to the various accounts credited are made as soon as possible while "Cash Account" is debited at the end of each month with the total amount of cash received.

FIG. II.

MONTHLY COST SHEET

Shipped ..
Used at mines
Gross tons:—
This month .
Last month .

Days worked .....

DETAIL OPERATING EXPENSES, 191

Outside Expenses	Labour	Material	Total	Cost per Ton	Cost per Ton Last Month
Tipple Expenses					
Weighman					
Tipple Men					
Box Car Loaders					
Dirt and Rock Bank					
Cleaning Coal					
Tipple Supplies					
Stable Expenses					
Labour					
Feed					
Harness					
Sundries					
Repairs, Wagons, Etc.					
Water Supply					
Repairs					
Boilers					
Buildings					
Tipple					
Machinery					
Tracks					
General Expenses					
Miscellaneous					
Shops					
Generating Steam					
Watchman					
Teaming					
Power Plant					
Management					
Superintendence					
Clerks					
Mining Engineers					
Office Expenses					
Stationery					
Legal Expenses					
Rental					
Royalty					
Insurance					
Liability					
Fire					
Taxes					
Depreciation					
Total Outside Exps.					

Inside Expenses	Labour	Material	Total	Cost per Ton	Cost per Ton Last Month
Airways and Gangways					
Chutes					
Trucks					
Yardage					
Mining					
Rooms and Narrow Work					
Pillars					
Yardage					
Timbers and Props					
Round Timbers					
Retimbering Main Entry					
Split Timbers and Lagging					
Putting in place					
Preparing Timbers					
Timber Packers					
Ventilation					
Fan Engineers					
Fire Bosses and Shot Lighters					
Brattice Men and Material					
Lamps, Labour and Material					
Trappers					
Transportation					
Chute Loaders					
Car Checkers					
Drivers and Runners					
Engineers and Rope Riders					
Oil and Oilers					
Pumping					
Pumpmen					
Repairs to pumps					
Pipe and Fittings					
Pumpways and Sumps					
Repairs					
Machinery					
Tracks					
Gangways and Airways					
Mine Cars					
Locomotives					
Power Line (Air)					
General Expenses					
Miscellaneous					
Pit Bosses					
Wash House					
Total Inside Expenses					
Improvements					
Total Improvements					
Recapitulation					
Outside Expenses					
Inside Expenses					
Improvements					
Total Expenses					

FIG. III.

DAILY INSIDE LABOUR AND COST SHEET

Tons..... Date .....
Diggers to-day.....
do yesterday.....
Daymen to-day.....
do yesterday.....

Occupation	No.	Rate	Amount		Per Ton	Dep't'l Per Ton	Average Cost	Remarks
Timber Men								
" Packers								
" Boss								
" Framers								
Building Chutes								
Boss Driver								
Car Checker								
Drivers, Single								
" Spike								
Chute Loaders								
Dumpers								
Track Men								
Shot Firers								
Brattice Men								
Clay Packers								
Trappers								
Rock Dumper								
Clearing Chutes								
TOTAL INSIDE								

OUTSIDE TOP LEVEL

Lamp Man								
Wash House Man								
Car Repairer								
Blacksmith								
TOTAL OUTSIDE TOP								
TOTAL								

FIG. III.—(Continued)

DAILY OUTSIDE LABOUR AND COST SHEET

Tons.....
Employees to-day.....
" yesterday..... Date.....

Occupation	No.	Rate	Amount		Per Ton	Dep't'l Per Ton	Average Cost	Remarks
Tipple Boss								
Weighman								
Dumper								
Car Shovers								
Picking Table								
Rock Bank								
Box Car Engineers								
" " Movers								
" " Cleaners								
" " Weighman								
Engineers								
Firemen								
Ashman								
Mechanic Helpers								
Blacksmith								
" Helper								
Carpenter								
Car Oiler								
Fan Man								
Pipe Fitter								
TOTAL								

SUMMARY OF COSTS

Inside Labour								
Outside Labour, top level								
" " bot. level								
Overhead Expense								
Supplies (Includes boiler coal and feed)								
Timber (Contract labour and material)								
Yardage								
Mining								
Sunday Labour								
Depreciation								
TOTAL								

The cash disbursements book would be ruled as follows:

Date	Check No.	To Whom Paid	Particulars	Folio	Dr.		Cr.		
					Acct. Payable	S'dry. Acct.	Disct.	Cash	Bank

Amounts charged to "Accounts Payable" and "Sundry Accounts" should be kept posted up to date, while the totals of the "Credit Columns," "Cash," and "Bank," are posted at the end of the month. When a deposit is made, "Cash Account" is credited in the cash disbursements book and "Bank Account" charged. The balance in this account will represent the amount of cash and checks on hand awaiting deposit.

It is advisable that all payments be made by check, and in carrying out this idea, the imprest cash fund system of handling petty cash is recommended in cases where the bank is easily accessible. The procedure is very simple. A check is drawn for a determined amount, say $500 and debited to "Imprest Cash Fund." This amount should always be in the safe in the form of either currency or receipts.

When the fund is depleted to the minimum, a voucher is made summarizing the receipts and passed through the invoice register, charging the various accounts and crediting "Imprest Cash Fund," and a check is drawn for the amount of the voucher, charging "Imprest Cash Fund" and crediting "Bank" account. Receipts for wages paid before the regular pay day should be held as cash until the regular pay day, and cash drawer reimbursed.

(To be continued)

Briquetting of Lignites and Coals

By G. J. Mashek*

There has been no abnormal increase or jump made in the installation of plants for the briquetting of fuels in 1916. The growth of this industry, however, is gradually increasing. During the year, three new plants were erected and two idle plants reconstructed. The outlook for 1917 is promising; orders for several plants have recently been placed with different manufacturers, with the prospects of a number of others being placed in the near future to be in operation in the fall of 1917.

With the increasing demand for fuel, especially of the better class for domestic use, in connection with the increasing cost of labor in the mines and transportation, the building of briquetting plants will likely increase rapidly from now on.

It must be borne in mind, however, that we have not yet reached the time when the briquetting of all fuels would prove profitable. It is almost out of the question to briquette good coking coals for either industrial or domestic purposes, for the reason that the briquetting of these coals does not change their nature. If ordinary binder is used, it may increase their smoke-producing qualities during combustion, so that fuels of this nature can be better treated by carbonization or coking, especially if the byproducts are saved.

The best field for this industry is in the briquetting of fuels possessing poor or no coking qualities—the slack and abraded coal at the mines and shipping centers, which is practically useless or of little value for any other purpose. Of this there are enormous quantities in many parts of the country that are either left at the mines or sold considerably below the cost of production. This class of fuel can be converted, if smokeless in its natural state, into an entirely smokeless and odorless product by the use of binders recently discovered and developed. Even fuels containing a considerable percentage of volatile matter, which are more or less objectionable for domestic use in their natural state, can be converted into briquettes that will be far superior to the prepared and screened sizes of the natural product from the dust or breakage of which they are made.

Considerable progress has been made within recent years in the development of patented, smokeless and odorless binders, especially for the briquetting of smokeless fuels, so that ordinary anthracite culm can be converted into briquettes that are cleaner and make a better fuel than the best prepared sizes of anthracite coal.

By the process of briquetting, the heating value of a briquette is increased very little above the coal from which it is made, usually varying from 2 to 5 per cent., due to the addition of the binder. The principal advantage of a properly made briquette is that it holds together during combustion and will be entirely consumed, usually without the formation of any clinker. Hence the combustion of the briquette leaves less unconsumed coal than remains on the burning of an equal weight of the prepared sizes from the degradation of which briquetted coal is obtained.

This decrease of carbon or unconsumed portions of coal in the ash, on ordinary anthracite, gives the briquettes as much as 30 per cent. greater heating value than the same weight of prepared sizes of coal, as the amount of unconsumed carbon remaining in the ash from ordinary anthracite coal varies from 25 to 35 per cent. The red ash, or free-burning coals, of course, leave a smaller percentage. The briquettes, as a rule, are always freer-burning than the coal from which they are made.

The briquetting of lignite has been developed so that this rather inferior fuel can now be converted into a practically smokeless product of equal heating value to the best Pennsylvania anthracite. If the lignite by-products, which are valuable, are saved, the lignite fields offer the most attractive opening for the installation of briquetting plants, and it is in this direction that considerable progress may be expected.

While recent statistics are not available, there are many millions of tons of briquettes produced in Europe, in practically all of which coal tar is used as a binder. This product in comparison with the coals mined in the United States, is inferior, and considerable ob-

*90 West St., New York City.

jection is raised here to the creosote fumes which the coal-tar pitch binder of the briquettes gives off during combustion. By proper treatment of the product this objectionable feature can be eliminated to a great extent.

In this country the principal binders are asphalts, or asphaltic compounds, which burn practically without smoke. A number of plants are operating on patented, smokeless binders, especially in the anthracite field.

There is considerable misconception in reference to the cost of plants and the cost of briquetting. The cost of briquetting, including binder, labor, power, wear and tear, depreciation, insurance and other overhead expenses, varies from $1.10 a ton up to $1.50 a ton, depending on the location of plant, which governs the cost of binder. This, of course, does not include the coal to be briquetted.

The cost of a plant for a given output per hour varies about the same as the cost of breakers and washeries, depending on the coal that is to be briquetted and the location of the plant. As a general statement, it can be said that a plant having a capacity of 5 tons an hour, using an ordinary coal-tar pitch or asphalt-base binder, will be approximately $30,000 complete with buildings, bins, etc., turned over to the owners in operation. A plant having a capacity up to 40 tons an hour may cost upward of $200,000. The cost of lignite briquetting plants runs still higher, depending on the product desired and the analysis of the raw lignite. These figures cover plants producing a briquette weighing from 2 to 2½ oz., and intended for marketing to the domestic user.

The question of the proper size of briquette to use is important. One experience showed that a 3½-oz. briquette was entirely unsuitable and not wanted, while a briquette made of the same material in the same plant, weighing about 2 oz., was found by the users to be far superior to any coal that they could obtain.

In addition to the proper size, depending on the coal it is made from and the purpose it is intended for, the briquette must present no sharp corners or edges that can be easily broken down and produce dust. The briquettes must be of a shape that they will spout so that they can be handled like ordinary coal. On account of its being a manufactured product, the briquettes must have greater hardness and be less susceptible to breakage than anthracite coal, no matter of what coals the briquettes are made. Lastly, the briquettes must be water- and weatherproof, contain either a small percentage or no moisture, must not deteriorate on exposure to the elements, sun, heat, etc.; in fact, properly made briquettes should improve with age.

It can truly be said that the experimental stage of the briquetting of fuels in this country is past, but like other materials, different qualities of coal require different manipulation and treatment in order to obtain the best product. No one process can be applied to all coals.

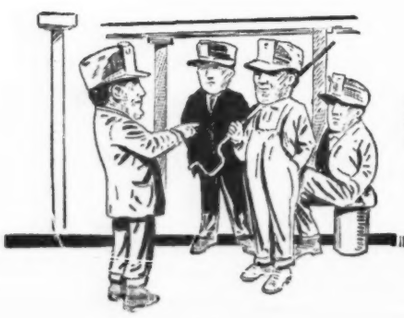
By
Rufus T. Strohm

IMITATORS

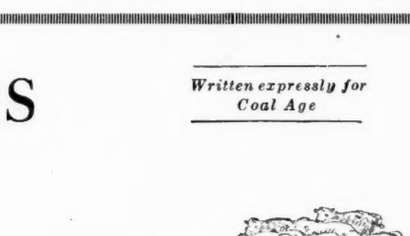
Written expressly for Coal Age

WE are an imitative race,
Though now and then someone denies it;
Our brain is in its proper place,
But oft we fail to exercise it.
We laugh to see some thoughtless cuss
Attack a job and muddle through it,
But when a like task falls to us
We use the same poor way to do it.

We smile in pity when we read
Of sheep that rush to death together
By dumbly following the lead
Of one old ignorant bell-wether;
Yet we are shallow-brained as they,
And quite as dull, if we but knew it,
For we are prone to ape the way
We see the other fellow do it.



We're Teaching Every Way We Can.



We Dumbly Follow the Leader.

IN early days of mining coal
Men did their work less circumspectly;
Thus many learned to tamp a hole
Or cap a fuse quite incorrectly.
And even yet, in spite of laws,
And though so many live to rue it,
We follow ancient ways, because
That's how we've seen our buddies do it.

But there is hope for all concerned
With safe and rapid modes of mining,
For by experience we've learned,
And faulty methods are declining.
We're teaching, every way we can,
The best and safest, as we view it,
That none may blindly choose a plan
Because he saw another do it.

Coal Trade in New York in 1916

SYNOPSIS—Heavy demand at the opening period with a slowing down in the summer followed by record-breaking prices at the closing period.

The year 1916 will go down into history as a record breaker for the anthracite coal industry. The highest prices ever paid for hard coal while the mines were being operated were paid during the concluding months of the past year, and these prices have only been exceeded by those paid during the six-months' suspension in 1902. Operators had to deal with more petty labor troubles, such as so-called button strikes, than ever before, and this notwithstanding the clause in the working agreement between the mine owners and their employees that a non-union mine worker shall not be discriminated against.

New York City was, in the opinion of many tradesmen, the battle ground of the anthracite coal interests in 1916. During the early months the matter of the new working agreement with the mine workers was discussed by the operators and a conference committee was selected to represent them in the negotiations.

Soon after the dawn of the new year the operating companies began an educational campaign and for several weeks prior to and during the negotiations for a new wage agreement inserted many advertisements in the newspapers setting forth to the public what an increase in wages to the mine employees would result in, and also telling the public that there had been increases in the cost of all materials used in the mines and that the operators were also obeying the employers' liability act recently passed by the state legislature of Pennsylvania. It was pointed out to consumers that the granting of an increase to the mine employees would no doubt result in an increase in the price of coal. Considerable good was accomplished by the campaign.

Much of the year has been taken up with investigations of various kinds. First came that relating to a shortage of cars resulting from freight congestion. At various times embargoes were placed by many roads and the greatest sufferer from this was New England. Later, toward the end of the year when, owing to the heavy demand and the scarcity of coal the market went skyrocketing, various investigations were undertaken by Federal and state authorities to ascertain the cause of the high prices. Many coalmen were questioned and their views ascertained. During this time milder weather conditions preceded a reduction of prices and the market became easier.

The year started off well. There was heavy demand in the early part of January. Individuals were able to procure premiums but deliveries were slow on account of transportation difficulties. There was a brisk demand for steam sizes, quotations going as much as 35c. above regular circular. Toward the end of the month weather conditions moderated and there was a decided falling off in the market. Operations at the mines then began to fall off, following the slow buying on the part of consumers and the efforts of the dealers to clean their yards of all high-priced coal before the close of the anthracite year on Mar. 31.

Much of this condition was no doubt due to the announcement of the miners' union officials that there would be no suspension of mining during the wage negotiations. Storms, however, caused a reaction and shippers with a supply of coal on hand found a ready market and good prices for their holdings. Loaded bottoms were quickly picked up. Some dealers placed orders for subsequent delivery, but many of these orders were afterwards cancelled.

March was a fairly active month. Supplies were in good demand, but there was no desire on the part of dealers to stock up. Buying was only to supply immediate wants and consumers of the anthracite steam coals, anticipating a peaceful wage settlement, did not urge heavy deliveries.

Aldermanic Committee Authorized

At this time the New York City Board of Aldermen authorized the appointment of a committee of their number to investigate and report on a more feasible plan than that in operation for purchasing coal for the city departments. This was followed by an appeal to President Wilson by local civic organizations to have an investigation made of the methods adopted for the distributing and marketing of coal and to determine the ultimate cost to the consumer.

Pending the wage negotiations, and while awaiting the publication of the new schedule of prices, buying was slow and everybody was waiting, while the mines worked about half-time and the stocks were running low. However, the signing of the new agreement did not create any excitement and demand in the early part of May was quiet. To add to the troubles of the coalmen, the marine engineers made demands for increased wages on the boat owners. After several conferences, however, this trouble was satisfactorily adjusted.

The first announcement of the new schedule of prices in May was followed by their withdrawal. At the same time word was received from Washington that the Federal authorities intended making an investigation to ascertain if the increased prices were justified. A week later, however, the new price list was again made public, subject to a 40c. discount and to be increased 10c. per ton per month until Sept. 1, when the full winter schedule of prices would be in effect. Pea coal was included in the list of domestic coals and subject for the first time to the provisions of the sliding scale of prices.

The trade had already been badly demoralized by the failure of the operators to announce the new prices, but the consumers responded quickly and there was a slight revival. Considerable of the Tidewater receipts were sent to New England water points. Production for May was the smallest for that month since 1909, but there was a recovery from the April depression and egg and stove showed a tendency to tighten.

While announcing that pea coal would hereafter be included in the domestic sizes, the producing interests let it be known that rice and barley coals would hereafter be included in what would be known as "boiler" size. This size did not take well and was later practically withdrawn by most of the companies that had started to make it.

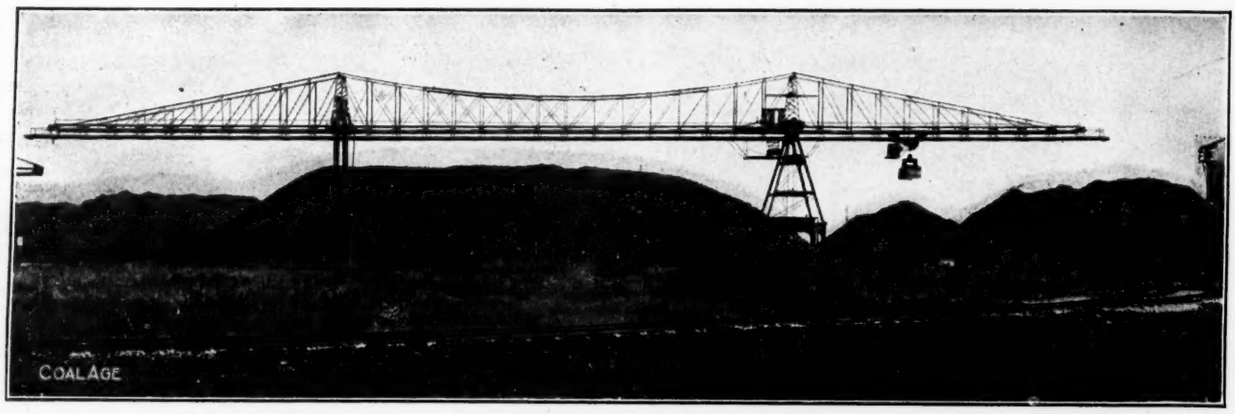
The greatest activity for the first half of the year showed itself early in June and before the end of the month most producers were sold up on stove and egg sizes. Chestnut size was long. There was a steady demand and the shortage of supplies began to look serious. Production was being curtailed by petty labor troubles. Similar conditions existed throughout the succeeding month, but there was plenty of pea and considerable buckwheat to be had. Some operators were turning down orders for egg, stove and chestnut coals and there was little prospect of any being placed in storage to meet the winter demand. Supply remained low, notwithstanding that July and August are generally the slowest buying months in the coal year. Scarcely more than enough coal was received at Tidewater to meet demands and the seriousness of conditions became more apparent to the public.

The market opened on the most strenuous month of its career in October. Demand had increased, but supplies had not. Individuals with free coal were able to dispose of their product at good prices and at various times received premiums as high as $2 for Tidewater shipments, while mine prices for inland trade ranged from $6 to $6.50. Demand kept on increasing and prices continued to advance. Weather conditions were favorable, and while there was a steady call, consumers did not become panicky until the middle of November, when the newspapers printed scare headlines describing market conditions. It was at this time that the officials began their investigations.

Quotations continued on the upward trend and reached the $12 mark, the highest price ever paid for anthracite coal at Tidewater except during the six months' suspension. This high price was for individual coal, the companies not advancing their price over the regular winter schedule. The latter, however, took on no new customers and refused new orders until those already booked were filled. No dealer, therefore, was able to get his full requirements, the companies dividing their stock pro rata among their customers. It was an opportunity speculators had been waiting for and they took advantage of it. Large retailers who dealt with the companies, finding themselves running short of coal, went into the free coal market and paid the high prices for supplies.

An easier feeling prevailed toward the end of the month. Demand became easier and prices fell off an average of $2 on mine quotations and more at Tidewater.

The year closed with the market nearly clear of coal and prices for individual egg, stove and chestnut between $9 and $10. The market was active the entire month. The opening prices, which were around $9 f.o.b. Tidewater for independent product, dropped during the second week nearly $2 on account of mild weather and the slackening of buying, consumers feeling they would be taken care of in the event of necessity. This was followed by labor troubles and embargoes at some of the docks and the anxiety of some dealers to lay in stocks on account of the holiday season and the curtailed production which was sure to occur during that time. The hard steam coals grew scarcer and the prices advanced. All this time the large producing companies were furnishing their customers with partial requirements at the regular schedule.



BROWNHOIST COAL-HANDLING BRIDGE TRAMWAY, ASTORIA LIGHT, HEAT AND POWER CO., ASTORIA, N. Y.

The following tabulation shows the quantities of anthracite and bituminous coal and coke exported from this port during the twelve months ending December:

1915	Anthracite	Value	Bituminous	Value	Coke	Value
December..	6,838	$36,687.00	2,309	$8,479.00	69	$494.00
1916						
January....	8,921	48,477.00	893	3,408.00	136	1,097.00
February...	8,740	43,573.00	1,245	5,167.00	817	5,617.00
March.....	8,231	46,325.00	2,193	9,684.00	2,177	12,433.00
April.....	19,257	100,023.00	2,229	9,142.00	1,677	15,874.00
May.....	17,809	94,613.00	4,419	15,296.00	1,331	10,086.00
June.....	20,949	114,510.00	5,108	21,404.00	966	8,914.00
July.....	19,489	106,756.00	4,387	15,731.00	1,897	14,095.00
August....	40,671	223,842.00	6,025	21,508.00	1,195	9,639.00
September.	6,800	37,396.00	1,012	3,387.00	2,447	17,742.00
October....	36,235	208,630.00	8,427	31,617.00	2,521	18,748.00
November..	7,751	61,545.00	1,934	9,279.00	1,957	14,657.00

The Bituminous Market

There were a great many changes in the bituminous coal market during the last twelve months, but at no time were the prices lower than those of the previous year. The year opened with a good demand and it practically continued throughout the entire period. Heavy consumption was not alone responsible for the year's activity. Shortage of labor and the scarcity of cars, together with the heavy call for supplies from the North and West, drew from the New York Tidewater large quantities of coal which under ordinary conditions would have been used in the East.

This city was the meeting place of the scale committees selected to arrive at a working agreement between the operators and mine employees involved in the interstate district and as a result what is known as the "McAlpin Agreement" was signed, sealed and delivered here. These conferences which began in Mobile, Ala., were trans-

ferred to New York and continued here until early in March.

In view of the heavy demand, and rather than have their mines remain idle while the country was calling for coal, some operators granted the men an additional increase, but there was little change in conditions, owing to the scarcity of labor, many mine workers having left the regions and gone into other industries, as had the workers from the anthracite mines.

Some of the companies refused the added demands of the men and practically forced the men to return to work by threats of prosecution for failure to live up to the terms of the agreement which they had signed through their representatives.

Following the signing of the new agreement the market became almost stagnant, but the demand from the Lake districts got underway and relieved the local situation. Conditions tightened somewhat in May, owing to the market being relieved of a large tonnage of Fairmont coal which had been sent into the Pittsburgh district to relieve that situation. Gas coal displayed abnormal strength, while there was a comparative dullness of steam coals. Then the railroads entered the market, leaving but a small tonnage of free coals. The West called for large quantities of coal and that tended to strengthen the Tidewater market by keeping the supplies down.

July opened with brighter prospects. Export inquiries had increased, but shipments showed a falling off, owing to the lack of bottoms. Toward the end of the month prices began to climb at the rate of 5 to 10c. a week. Gas coals and the high-grade steam fuels were hard to get at any figures and there were indications that the boom long predicted was on its way. Large consumers sent their representatives into the mining regions to close contracts at the mines and it was said that one hotel housed 28 of these men at one time.

An Active Fall Market

The threats of the railroad employees to tie up transportation had a decided effect upon market conditions and prices grew stronger. At that time predictions were made that the local market would have $5 coal on about Oct. 1, and to get ahead of this buyers placed orders for immediate delivery. Lack of supplies, however, made this impossible. Demand continued heavy, and with nearly all contractors about 20 per cent. behind in their requirements and with little prospects of their catching up, $5 coal became a reality.

The November market exceeded that of any previous time and reached the high-water mark of $8 f.o.b. Tidewater for anything that looked like coal. Mild weather, however, eased the market somewhat and prices toward the last of the month became easier. But while the supplies did not increase in volume, the demand was not urgent and shippers got a breathing spell.

Shippers of bituminous coal had an active December. Demand was quiet the first week or ten days and then regained its former strength. Labor was short and the car supply was far from normal. Large consumers began to make inquiries regarding new contracts and found that the average price for next year's supply would be on an average of $3. Quotations as high as $3.50 were heard. Then certain operators in the central Pennsylvania district increased their miners' wages 33⅓ per cent. Shipments from certain lower port docks were slow during a part of the month, owing to labor troubles and embargoes, and in some instances from 10 to 15 days were necessary to get a boat loaded. Prices during the month ranged from $6.50 to $8, according to grade.

The following is a summary of the Tidewater quotations for various grades of bituminous coal during the year 1916:

Month	Georges Creek	South Forks	Nanty Glo	Quemahoning	Fairmont
January....	$4.30@4.80	$4.05@4.55	$4.05@4.55	$4.05@4.55	$3.80@3.90
February...	4.25@4.75	3.50@4.25	3.35@4.25	3.35@4.25	3.25@3.75
March.....	3.75@4.50	3.50@3.75	3.35@3.60	3.45@3.60	3.10@3.40
April.....	3.50@3.75	3.25@3.75	3.10@3.60	3.10@3.60	2.75@3.10
May.....	3.50@3.75	3.20@3.50	3.00@3.25	3.00@3.30	2.70@2.90
June.....	3.50@3.80	3.10@3.50	3.00@3.10	3.00@3.10	2.80@2.90
July.....	3.50@3.65	3.20@3.55	3.10@3.20	3.00@3.30	3.00@3.90
August.....	3.50@3.65	3.30@3.50	3.10@3.25	3.00@3.25	3.00@3.20
September..	3.50@3.80	3.40@3.65	3.40@3.50	3.10@3.40	3.20@3.80
October....	4.50@5.05	4.25@5.00	4.25@5.00	4.25@5.00	4.20@5.00
November..	6.50@8.00	6.75@7.75	6.50@7.75	6.50@7.50	6.25@7.75
December..	6.50@8.00	6.25@7.75	6.25@7.75	6.25@7.75	6.25@7.75

The dealers believe that if the proposed change and reduction in the number of sizes of coal had been carried through it would have simplified the business and in New York would have doubled the yard capacity and enabled the dealers to carry much heavier stocks of the fewer sizes.

The retail dealers looked with favor on the formation of the Individual Operators' Association, it being anticipated that its output would go through a clearing house, so to speak, and be sold on the same basis and at the same prices as the company coals. The natural effect of such an organization, it was felt, would have been to give the dealer an additional and permanent source of supply, for which he would pay no more and no less than he now pays regularly. In other words, it was believed the new organization would do away with premium coals.

The climax of the situation was reached when the shortage of coal manifested itself in October and November and the dealers found it impossible to secure enough coal from their usual sources of supply to take care of their trade. They were forced into the open market, buying coal at premiums ranging from 50c. a ton at the start up to $5 and $6 per ton early in November, above the circular prices. There were frequent adjustments of retail prices which varied widely, even among competitors in the same districts, due, of course, to the position in which each dealer found himself. If one had a fair stock on hand and was getting a goodly proportion of his coal from the companies, he naturally made his prices accordingly; but if he had to buy his supply at the greatly advanced prices, he made his prices in accordance. Retail prices for domestic coals went as high as $12 per ton in some instances, but inasmuch as some dealers bought coal at from $10 to $12 per ton wholesale, the reason for the apparently high prices can be explained.

In the first part of December conditions were almost normal.

New York Coke Market

The consumption of coke is rapidly increasing in New York City. Its manufacture last year was greatly interfered with by the scarcity of coal and the consumption was greatly reduced. The demand increased, but the supply was short. The selling price was $6.25, an advance of 75c. over the previous year's prices. Under normal conditions it is estimated that the consumption in the city will amount to between 150,000 and 200,000 tons, much of which is used in the poorer class tenements.

Even Without Export Trade Baltimore Does a Big Business

Big changes have come over the coal trade in Baltimore during the year that has just come to a close. Many of these will undoubtedly be of a permanent nature, while others brought about by unusual conditions, will be only temporary in character. Anthracite in this market, as elsewhere, is selling for more than ever in its history, and no well-posted coalman expects that it will ever revert to former figures. Soft coal, as a result of a labor and car shortage of the most pronounced type and a big demand as indicated in the increased rail movement of fuel, went to undreamed of prices. At one time, it even sold at the mines much above the mine price of hard coal.

Since September steam and gas coals have been quoted at the mines at prices between $4 and $7. Should an end come to the war, the prices may fall heavily. Many believe, however, that under existing conditions high prices will be maintained over the coming summer. The first contracts for deliveries over the new year were at prices $1 to $1.50 higher than those made on Jan. 1 of last year. Few mines are willing to accept contracts for the full twelve-month period at less than $2.50 to $3 a ton at the mine. So much money was made in the open market in the past few months by coal interests that did not have contracts for all their coal that operating interests are disposed to take a chance of operating without commitments unless exceptionally good contract figures are offered.

The past summer was the tightest the coal trade in Baltimore has ever seen. There was no great break such as came in the year before, when coal was practically offered at any price. In that year even the less desirable coals were but rarely sold at prices above a dollar. Last January started off with a big car scarcity, and steam coals brought anywhere from $2.25 to $3 at the mine. February brought a slump, with the best coals offering at the mine tipple around $1.75 to $2, and lesser grades down to $1.40. March saw a continuance of this condition, and then April ushered in the real low period of the year, when first-grade steam coals were quoted at the mines around $1.40 to $1.60 and low-grade fuels and gas coals could be had anywhere from 90c. to $1.05.

May hung close to the above figures, even shading them at times, but June saw a tightening of the market so that little coal of any kind was offering below $1.35 and best-grade coals were worth around $1.60. July saw still further tightening, and the real upward trend came in August. The story of the sensational rise of fuel over September and October, which continued into November and December, is well known. Many industries were caught short, for the Tidewater terminals were swept clear of coal, and the railroads were delivering not more than 20 to 30 per cent. of the cars needed. As a result, coal bought in the market was sold at from $6 to $7, on a mine basis.

After all, the most sensational feature to the trade in Baltimore has been the blow dealt to the export trade. Unable to get vessel bottoms at times, or unable to get coal when bottoms were available, the trade was hard hit from time to time, and great caution had to be exercised in undertaking foreign obligations. The result was that the export business which in 1915 reached such remarkable proportions—a total of 1,901,466 tons having been sent out to foreign ports—fell off considerably.

The outlook is that the official total for 1916 will show an export movement from Baltimore of about 870,000 tons, a drop of more than 1,000,000 tons from the sales of the previous year. In 1914 the export movement from Baltimore totaled 940,706 tons and in 1913, 870,751 tons, which had been a gain of more than 200,000 tons over 1912. The only explanation is that exceptional conditions raised by the war created the large export tonnage of 1915, and exceptional conditions of an opposite character last year reduced the traffic. The first 11 months of 1916 saw 823,318 tons of coal loaded for export at Baltimore docks.

The bunker trade at Baltimore also declined last year. The total for the twelve months will prove slightly in excess of 500,000 tons, against more than 600,000 tons in 1915. For harbor and coastwise bunker purposes, however, the port will show a gain, more coal having been handled over the local piers than ever. This is partly due to the large increase in the Western Maryland R.R. coal tonnage.

The trend of the times is shown in the fact that the Baltimore & Ohio R.R., despite loss on export tonnage, increased the amount of coal hauled. For three-quarters of the year ending Nov. 1, the road transported 28,257,278 tons of coal and 3,645,598 tons of coke. In the same period of 1915 it handled 25,958,186 tons of coal and 3,016,397 tons of coke. October, the last month, showed a big drop from October of the year previous, the great car scarcity being to blame for the decline in tonnage. The Western Maryland R.R. to Oct. 1 hauled 2,467,129 tons against 2,230,984 tons for the same period of 1915.

The Baltimore & Ohio handled more than 2,000,000 tons of domestic coal, coastwise, bunker and harbor trade over its local piers, outside of its export business. The Western Maryland handled about 1,250,000 tons of its total coal traffic, export and domestic, over its Port Covington pier.

While the Northern Central at Baltimore is principally an anthracite road, handling annually about 1,250,000 tons on all-rail delivery to that city, it also handled about 300,000 tons of export coal over its Canton pier. With the all-rail record of the Baltimore & Ohio and Western Maryland for local delivery running in excess of 1,500,000 tons, it is estimated that the three railroads dumped here in 1916 about 6,000,000 tons, despite the loss of export business of over a million tons. While Baltimore did not do as large a business as in 1915, when the export trade was brisk, it nevertheless more than maintained its average coal absorption.

The retail hard-coal trade had its troubles all through the year. A delayed schedule in the spring and then a fixing of prices about 50c. above the previous year disturbed the market. Consumers were slow to come in, even when a discount period was announced for June, July and August. Only about a half of the usual summer delivery was made. Then came fall, and with it inability to get coal because of car scarcity. Winter came with December and much summer business was still undelivered. The retailer often found he had to lose the premium he paid on coal in order to keep obligations which he had placed on the books at summer rates. As a whole the hard-coal men, despite the high prices and the steady demand for fuel were worse off than in previous years.

Hampton Roads in 1916

Exports have been heavy, practically on the same basis as last year, due principally to the withdrawal of British coals from neutral markets on account of restricted output. Foreign business, in common with other trade, fell off toward the latter part of the year, due to car shortage.

A glance at the list of countries to which coal is exported from Hampton Roads will disclose the healthy condition of the trade. There are some 40 different countries comprising the British, French, Dutch and Danish West Indies; Mexico and Central America; the whole of the South American continent, both east and west coasts; the Canary Islands; the Azores; the West Coast of Africa; the Dutch East Indies; Cuba; Canada; the Mediterranean, also an occasional cargo to Scandinavia.

The tonnage shipped to the Canal Zone, for the operation of the canal and the coaling stations at Cristobal and Balboa, aggregating some 600,000 tons per year, is exclusively American coal and is not subject to foreign competition. There is no doubt that a large portion of the exports of 1915 and 1916 was due to the effect of the war on the coal trade of our competitors, but exporters expect to retain a considerable and increasing share of this trade even when conditions again become normal. The smokeless coals of Hampton Roads are well established in foreign markets, also American banks are opening foreign branches. This fact is particularly important, as American exporters expect their banks to assist them in a large measure in extending long credits, to which certain foreign customers are accustomed and which have been granted by our competitors.

The larger part of the export tonnage is carried in steamers, though this year has been remarkable for the number of sailing vessels of all flags engaged in this trade. This was due to the scarcity of steamer tonnage, forcing exporters to use any class of vessel obtainable. Freight rates have shown remarkable fluctuations during the year. The early part of 1916 rates were so high that exports were seriously restricted. The latter part of the year rates were on a much lower basis.

Shippers Now Operate Their Own Vessels

The principal destination of coastwise tonnage is New England, through the ports of Providence, Boston, Portland, etc. There are established at these ports modern wharves and discharging plants for the distribution of coal to inland territory. Transportation from Hampton Roads is by steam colliers, barges and schooners. Several of the larger shippers own and operate fleets of steamers and barges and are not subject to the fluctuations of the freight market.

Shipments to Southern ports are principally carried by small schooners as orders for this market are usually for small lots and this class of vessel is engaged in the Southern trade. Coastwise freights have been fairly constant throughout the year. The difference between the lowest and highest rate was about $1.

Bunker deliveries have been fair for the year. This class of business has been largely augmented by steamers loading here and neutral steamers trading to Great Britain and Europe taking on sufficient coal here to take them across and back to the United States, thereby avoiding replenishing their supplies at the high prices ruling at foreign coaling stations. Prices for bunker coal are now conceded to have been too low for 1916 and better prices will no doubt be secured this year.

Deliveries to the local trade have been increasing for some years past, and the present year has been exceptionally good. A large part of the tonnage for local consumption is delivered on tracks and is not included in the figures for the dumpings over the various piers. The majority of Pocahontas and New River coal used locally is for manufacturing establishments and public-service corporations. The domestic demand for these coals is very light.

The high prices prevailing in the latter part of the year have attracted a number of the high volatile coals to Hampton Roads. There is always a small tonnage of these coals moving both coastwise and foreign, but it is only under unusual conditions, such as a shortage of Pocahontas and New River, that any considerable tonnage is shipped to Tidewater.

Prices were on the basis of $2.75 per gross ton for standard Pocahontas and New River coals up to Sept. 1. Shortly before this time consumers all over the country began stocking up in anticipation of a railway strike. This unusual demand exhausted stocks and about the same time the shortage of cars began to be felt. Since that time the car shortage has steadily become more acute and stocks at Hampton Roads have never been replenished. There has been no lessening of demand and as a consequence prices have advanced. At the close of the year the same coal that was selling for $2.75 up to Sept. 1 was bringing $8.50. Most contracts for this territory run from April to April. Bunker contracts, however, are closed for the calendar year.

The principal Australian lines have now decided to make Hampton Roads a port of call. These steamers will help bunker deliveries considerably, as they are all large ships and take heavy supplies. Work has commenced on the construction of a large briquetting plant to supply the export trade. It is not expected, however, that the plant will be completed for a year. There have been no changes in the loading facilities of the Norfolk & Western Ry. at Lamberts Point, and the Chesapeake & Ohio Ry. at Newport News, the present piers being well able to take care of the business. The Virginian Ry. is making several changes in its Sewalls Point pier by the installation of elevators, new car dumper, etc., which will increase the dumping capacity materially. These changes will give the Virginian a pier similar to the new piers of the Norfolk & Western and Chesapeake & Ohio, which excel any in the world for quick loading.

All records of the Hampton Roads dumpings were broken during the year 1916, when a total of 16,591,575 tons of coal were dumped. This is an increase of 1,799,095 tons over 1915, when the dumpings amounted to 14,812,480 tons. Monthly dumpings were as follows in gross tons:

	N. & W. Ry.	V'g'n Ry.	C. & O. Ry.	Total
January	586,135	381,326	455,620	1,423,081
February	584,699	328,540	364,798	1,278,037
March	626,880	389,301	377,679	1,393,860
April	679,864	292,958	380,413	1,353,235
May	678,110	369,196	446,818	1,494,124
June	778,574	307,807	380,518	1,466,899
July	609,446	376,649	442,194	1,428,289
August	821,412	386,361	446,918	1,654,691
September	664,773	363,178	371,951	1,399,902
October	553,462	400,437	333,603	1,287,502
November	439,093	347,758	392,886	1,179,737
December	455,917	341,346	434,956	1,232,219
Total	7,478,365	4,284,857	4,828,353	16,591,575

Detroit in 1916

The opening of 1916 found Detroit plentifully supplied with coal of every variety; its departure leaves many wondering where and how they will obtain additional coal when present supplies are used. Though the passing days have created a situation, which was only less serious than the conditions during the memorable shortage of 1902, it is worthy of note that no local consumers have suffered by reason of actual deprivation of coal supply. There have been intervals when delivery was apparently uncertain, but, almost without exception coal arrived when it was needed.

With nut, pea and slack at times available at from 65 to 75c., mine-run at 90c. and three-quarter lump at $1 to $1.10, the steam coal users were perhaps not to be blamed for maintaining an air of aloofness early in the year. The fact that three or four or even more jobbers might be trying to sell them the same consignment of coal merely strengthened the consumer's belief that the market was flooded beyond the saturation point with coal. Even the rumors of possible labor troubles in connection with differences over working agreements, which were heard in March, failed to seriously disturb the confidence of the coal users.

There were a few, however, who made some effort toward providing against a possible emergency by accumulating a small reserve supply. But the larger number maintained the policy of buying only when they could get cheap coal and when the month of April passed, with no serious interruption to the supply, they were still less inclined to heed the suggestions that conditions seemed to be shaping themselves toward a serious car shortage, which would greatly impede the movement of coal.

Meantime the opening of Lake navigation and the heavy demands from the Northwest had absorbed much of the surplus coal. Prices now began settling into the firmer tone, which prevailed through May, June and July, when mine quotations on nut, pea and slack ranged around 80 and 85c., mine-run 90c. to $1, and three-quarter lump about $1.10 to $1.15. Larger demands from outside markets took from the Detroit market practically all the Pittsburgh No. 8, a very considerable part of the smokeless coal and most of the fuel from the Fairmont district.

In July the local market began to feel the car shortage more directly and there were more persistent reports that cars would not be available in the fall. Increasing consumption by the industrial plants also was producing a more regular buying movement in the Detroit market. Some of the heavy consumers, which store large reserves, were beginning to find that their daily receipts were not being maintained in normal volume and that coal after being loaded on the cars at the mines was slow in getting through. Lake freighters too were finding cargoes difficult to obtain and were making the upbound trips light, counting on the remunerative carrying charges on iron ore and grain to yield them sufficient revenue to offset the loss in freight on coal.

The hardening tendency in prices noted in July became more pronounced in August and was followed by advances. The supply was also gradually diminishing, as the car shortage became more acute. Through September and October the gradual tightening in the supply developed into an actual scarcity of coal that prevailed through November and December. Prices advanced so rapidly that even early in November increases of 15 to 25c. within a few hours were not uncommon. The situation was aggravated through August and September by the cutting off of all shipments from the flood devastated Cabin Creek section of West Virginia. Price distinctions between different sizes of steam coal were lost early in November and by the middle of the month all sizes were selling at a uniform mine quotation of $5, while domestic sizes, equally scarce though in less pressing demand, were quoted 25 to 75c. higher than the steam coal.

The Anthracite Trade

In the anthracite trade buying was delayed in the spring, by the uncertainty concerning prices due to the controversy with the miners over the working agreement. Further delay resulted from the withdrawal of the first quotation sheet sent out and the lapse which preceded the announcement of the final circular.

In September the retail selling prices of anthracite were advanced 50c. a ton, placing egg at $8.50 and stove and chestnut at $8.75, making an increase of $1 a ton over the price during the summer of 1915. The higher prices and continued moderate temperature delayed the distribution of anthracite to an unusually late date. As a result the retailers in many instances restricted delivery to only a proportion of the quantity ordered, trusting to good fortune to have enough coal coming in through the winter to enable them to meet the later need of the customers.

A Year's Trade at Buffalo

The coal trade in Buffalo remained tranquil during the early part of the year, but became greatly excited early in September on account of a shortage of both cars and miners. Though Buffalo seldom pays extreme prices for bituminous coal and in great part escaped them this time, it suffered as much as other centers from the inability of jobbers to fill their contracts. As a rule consumers had neglected or refused to order their coal while the market was quiet, but they were eager for it when prices went up, even demanding that arrearages be made up. Contracts had been made at 10 or 15c. higher than last year, mostly on account of the increased cost of mining.

The September advance was rapid and soon the market went beyond all bounds. Coal which had brought a bare $1.25 at the mines went in some instances as high as $7, to which must be added $1.10 for freight from the Allegheny Valley or $1.25 from the Pittsburgh district, besides the jobber's profit, which was no longer confined to 15 or 20c. a ton. Not till November was there any material sag in the market, but when it came it was almost as rapid as the rise had been, so that during the first week in December coal was offered on the track at prices as low as $3.60 per net ton, f.o.b. Buffalo. These extremes, however, do not involve as much profit as might be imagined, for only a comparatively small percentage of the coal actually sold at any such prices. As a rule contract prices held, and much uncontracted coal went for only $1 or $2 more than contract rates.

While the car supply has not really increased, the situation has now quieted down considerably. When deciding what to ask for coal the jobber does not allow his expectations to soar too high. However, it is not believed

that prices will fall, at present, to last summer's low level and perhaps they may never decline so low.

The anthracite market became excited at the same time as the bituminous. In fact the consumer soon became convinced that the supply was going to fail entirely and began to make a run on the market as strenuous as the run of depositors on a failing bank. While the standard anthracite companies did what they could to quiet the consumer by declaring that the supply was ample, and also by making little or no increase of price, other producers, not regarding themselves as being under any obligation, took advantage of the situation and asked all manner of fancy prices on the strength of a promise to furnish a full winter's supply at once. Buffalo paid as high as $4 premium for independent anthracite and the Niagara Falls retailers for awhile charged $12 for anthracite coal.

The year closes with the standard shippers apparently making good their claims, and the daily press is no longer adding to the excitement by presenting figures showing that anthracite mining is far in arrears of that of a year ago. The independents are now asking lower premiums and the clamor for anthracite is subsiding. At the same time it is not denied by anyone that a cold winter would make all coal exceedingly short, both near the mines and especially in Canada and the West.

The coal trade of Buffalo on the Great Lakes suffered during 1916 from a lack of coal. Only anthracite is shipped from the port, but the mines were not able to produce enough to satisfy the demands of the Upper Lake ports. Furthermore, one leading dock was being rebuilt most of the season. Nevertheless the shipments reported, including those from Erie, Penn., which were forwarded to that place by rail while the dock was unfinished, were 3,670,840 net tons, as against 3,864,072 tons in 1915.

Tonnage on the Lakes was easy to secure, owing to the large amount of freight shipped eastward. Most of the coal went forward on a 30c. rate to leading Lake Superior ports and on a 40 to 50c. rate to leading Lake Michigan ports. An early advance to 85c. and $1 on cargoes to Lake Michigan was made on account of the lack of eastbound cargoes from that point. The Lake Superior rates continued unchanged almost to the end of the season, a few of the last cargoes paying $1.

Toledo's Quiet Spring and Busy Fall

In the early part of last year the coal business in Toledo was unusually quiet. But about the middle of August there seemed to be a general awakening, and everybody wanted fuel and wanted it at once. As a result prices went fluttering up into the clouds. The domestic market was most affected, but the same conditions applied to a greater or less degree in the steam trade as well.

The coal men in Toledo state that the dealers were unable to buy earlier in the year because the scarcity of labor made it impossible for them to unload cars. The buying public at that time also seemed to be in a lethargy and would not purchase coal. The dealers, of course, did not exert themselves to obtain business as they would have done had the demand been better and had they known that there would be a call for the coal when they had secured it. Suddenly something happened and the public, which had been perfectly apathetic toward the coal situation, wanted coal and wanted it quickly, and the dealers and operators were unable to supply the demand.

Generally there is an over-supply of fine coal during the Lake season, but that was not true of this year. The demand for coal of all grades has been in excess of the supply, and quotations for "black coal," regardless of size or grade, were at one time around $5 and $6. During the last ten days of the year the call was lighter and prices dropped a little from this figure, the high points ranging around $3 and $4.

The Lake shipping throughout the year has been as heavy as the coal received would permit. However, there has been a decided shortage in Lake coal, due to the inability of the operators to secure labor and cars to take care of the large demand. One big shipping concern at Toledo reports a shortage of lake coal of 150,000 tons, a large percentage of which was Pocahontas fuel.

There was much complaint at Sandusky because the grain men diverted the large coal-carrying boats to their service. They shipped more largely in boats this year because of the car shortage. By the middle of November there were more than 1000 cars loaded with coal standing upon the terminal tracks of the Pennsylvania R.R. at Sandusky waiting for boats in which the coal could be shipped up the Lakes.

During the past year the following new concerns have been added to the list of prosperous Toledo coal firms. The Pocahontas-Winifrede Coal Co., a Huntington (W. Va.) concern, has offices in the Ohio Building in charge of E. W. Ervin. A. A. Taylor, formerly connected with the Toledo Sales Co., has also opened an office in the city, being located at 946 Ohio Building. C. B. Grandy, an old-time coal dealer, has discontinued his connection with the industry and is now selling automobiles.

The Cincinnati Market

The Cincinnati coal trade experienced the best business in its history during 1916, in spite of the difficulties imposed by the almost constant car shortage and the consequent inability to supply consumers with fuel. During practically the entire year demand has been strong and active, and within the last four months prices reached unheard-of levels. The year has been especially satisfactory when contrasted with the dull and unprofitable years of 1914 and 1915, and while operators have not in many cases reaped large profits, it is still true that, everything considered, the year has been one of extraordinary activity in the trade.

Starting with every indication that industrial activity was making itself felt in the trade in the shape of an increasing demand for fuel for steam purposes, the year has seen the call for coal rise steadily to the semi-panic conditions experienced during the past few months. The only wonder was that the remarkable business experienced by manufacturers throughout the territory served by this market did not sooner reflect itself in the coal trade. However, the fact remains that 1915 was dull, and that it was not until 1916 began that the insistent demand for coal commenced to make itself felt. Contracts were renewed, as a rule, at figures higher than in the previous year, increases ranging from as low as 5c. a ton to as high as 15c.

It is the existence of these contracts, made at a time when the figures represented by them, ranging from 90c.

to $1 a ton f.o.b. mine for nut and slack, looked good, that has prevented operators from making much money out of the big bull market that has prevailed of late. Limited by the lack of cars to less than one-half of their capacity production, in most cases, as far as West Virginia and eastern Kentucky fields are concerned, and unable to supply their customers, much less to find free coal for the market, operators had to stand by and watch wholesalers and jobbers, fortunate enough to have a supply of coal, reap the rich harvest offered by a hungry market.

The obvious result, however, has been extreme reluctance on the part of operators to commit themselves for the coming season, and large consumers, now anxious to contract, find that the prices regarded as high for contract coal a year ago are completely eclipsed. The better grades of bituminous nut and slack will hardly be sold under contract for less than $2 to $2.25 f.o.b. mines, and, as stated, operators are by no means looking for contracts even at these profitable prices, in view of the strength of the market and the apparent probability that high prices will continue. It is safe to say that contracting will be slow and that many consumers will find it impossible to secure contracts covering their requirements, save at unheard-of figures.

Car Shortage

The car shortage, of course, has been the big factor in this market, as in all others. It was in evidence at the beginning of the year, and there has hardly been any improvement, save in spots, here and there, during the entire period. During the dull period of the late spring and early summer, when the demand for fuel was at its lowest, the shortage was naturally not felt as much as at other times, when the trade was being pressed for deliveries; but it is safe to say that taking the year as a whole, and considering all districts, rolling stock has not been available for more than half the requirements.

The reports of the three principal coal-carrying lines serving this market indicate that there has not been anything resembling a coal shortage, if the amount loaded is compared with a normal period. Records have been broken month after month, and the year's figures will probably show the highest tonnage loaded by the Norfolk & Western, Chesapeake & Ohio and Louisville & Nashville railroads of any year in their respective histories. But the demand, based on actual requirements of the country, has also broken all records, so that even the immense quantities of coal mined and forwarded have been insufficient.

The river has not cut a large figure in the local market of late, on account of low water during the latter half of the year. The movement during the first half of the year, however, was all that could be desired, the stage of the Ohio remaining high, and enabling the shipment of all the coal that river companies cared to send down. With a normal rainfall during the latter part of the year much more river coal would have been moved, as the car shortage would have brought much fuel to river loading points from operations which could make a short haul, or which have both rail and river loading facilities.

The disastrous floods which devasted the Cabin Creek and Coal River valleys of West Virginia in August removed a considerable number of operations from the field for about two months, and had something of a sentimental effect on the general situation. As a matter of fact, however, this factor, while causing great damage and loss to the companies whose mines were affected, and while it caused many men to drift to other sections on account of inability to obtain work for a time, did not affect the market appreciably.

Labor troubles have been comparatively little in evidence, as far as any effect on the market is concerned. A number of strikes have occurred in West Virginia, but without exception these have been settled in short order, either by arbitration or by concession of the demands made. Voluntary wage increases announced by the operators in several districts lately indicate both an appreciation of the increasing cost of living and a desire to hold the men as against the temptation offered by high wages prevailing in manufacturing lines.

There have been labor losses of some consequence caused by the short-time operations resulting from the limited car supply, coupled with the ability of the men to get work in the manufacturing centers at high wages; and this is a matter which will probably continue to cut down the available labor supply at the mines until present industrial conditions simmer down somewhat.

A heavy Lake movement and the continued growth of the export business brought about by the war have helped to stimulate this market by taking more West Virginia coal than has been the case heretofore. More eastern Kentucky coal than usual has come to this market, aside from that going on to Northern and Northwestern markets, to take the place of some of the fuel which formerly came from West Virginia. Smokeless coals, always in high favor for all purposes, and at the top of the list for export, have maintained their position in the market and are hardly available for contract purposes at any price.

The Louisville Market

Wholly unprecedented combinations of circumstances have featured the Louisville market during the year just closed. These resulted in many unusual coal-trade conditions, with sensational fluctuations in prices. Several times during the last two months prices in the open market have gone to the top figures. Influence of operating conditions has in the main been against making the year a profitable one for the coal trade of Kentucky, although on striking the average the year is discovered to have been a good one.

Beginning with the first of the year, the market was affected by the abnormally moderate weather and prices were such as, for the second successive winter, to suggest to the retail dealer that he might better take chances of buying in the open market than to contract in the summer months at a price which he could often better in the height of the season. This feeling is believed to have curtailed contracts written during the spring and summer, some of them at lower prices than during previous years. The fact that numbers of buyers were intending to buy in the open market, however, added to the panicky conditions that developed when the car shortage became acute.

This car shortage, with a further shortage of labor, and perhaps a 25 per cent. increase in eastern Kentucky operations, was the outstanding feature of the year and has been the principal trade influence. Embargoes placed by the Louisville & Nashville, Illinois Central and other roads serving the Kentucky fields, crippled the ability

of Kentucky operators to make delivery in the Lake market. They also caused a partial glutting of the Southern market and smashed prices, while on lifting of the embargo a waiting, mild-weather Northern market was slow to purchase at the prices asked. Complete failure of the river supply, due to low water in the Ohio from May until past the first of December, further affected the Louisville market.

To the honor of the Kentucky operators it is recorded that there were comparatively few instances of attempts to evade shipments on contracts in order to realize the sensationally high prices offered by desperate consumers. Some indication that contracts would be ignored caused large consumers to dispatch men to the Kentucky fields to see that their pro rata of coal was given them. There have already been filed a number of suits that will be followed by others and which, altogether, will probably result in a new contract law. For the most part, however, the operators appreciated the fact that conditions have been acute and undertook to do their best by their contract customers, counting on the domestic sizes sold on the open market to make up for deficiencies caused by contract deliveries.

A long continued strike involving an important section of the western Kentucky field limited the influence of that field in the summer market and found stocks of this coal and contract supplies very low when the season opened in the fall. Eastern Kentucky operators, in filling steam orders during the summer months, accumulated huge stocks of domestic coal at Louisville and other centers. These, however, were quickly reduced when the car shortage became severe. Numerous industrial plants dependent on the Kentucky fields actually suspended operations for lack of fuel, while high prices of domestic curtailed consumption and promoted occasional municipally conducted markets. Long continued mild weather also worked against prices and the demand.

Few important changes in the coal industry are noted. The year has seen the passing of the Scanlon Coal Co. and the retirement of its president, Granville T. Rider, the Wallins Creek Coal Co. succeeding to its holdings. Byrne & Speed and the Laurel Coal Agency in Louisville have consolidated. The C. S. Meddis Coal Co. has entered the field and there have been the usual numerous changes in the small retailing businesses.

The tendency to make Louisville the selling point for the southwestern Kentucky field is developing. The Wallins Creek Coal Co. has now established its principal offices here, and it is reported that two of the other important operating concerns in that field will shortly open permanent sales headquarters in this market.

Birmingham Coal Market

Coal-trade conditions in the Alabama field at the beginning of 1916 were very unsatisfactory. The demand was slack and the keen competition engendered in the efforts to secure the small volume of business offered brought about a demoralization in prices, which reached a level approximating so nearly to the cost of production as to be unprofitable to the mines. Operations were confined to a 70 to 75 per cent. schedule, with the exception of the larger mines of the furnace operating companies, where maximum outputs were the order. The improved conditions in the pig-iron market, which developed in the last quarter of 1915, warranted the placing in commission of most of the idle stacks in the district, thus creating a need for a large amount of coal and coke for consumption at these plants. The surplus production from these mines was applied on contracts with railroads and industrial plants, extending over the first half of 1916.

During the first week in July heavy rains set in, which shortly assumed flood proportions. The result was that many mines in the district were drowned out. Railroad tracks, trestles and bridges were washed away and the production and movement of coal were seriously interrupted. The limited stocks carried throughout the Southern territory were soon depleted. When the mines were again in position to resume shipments, they were confronted with a car shortage that handicapped them in their efforts to catch up with past due deliveries on contract business. Unable to secure sufficient cars to provide their customers with an adequate supply of fuel for daily consumption, the mines could make little progress in moving the delinquent tonnage. All the larger operators during the dull season were compelled to book business at a small margin of profit and due to the shortage in equipment furnished during the last five months of the year and the consequent restricted production, found it difficult to participate in the heavy spot market which developed during the last quarter, not having the free coal to meet the demand.

Scramble for Free Coal Started in August

Early in August the trade began to show signs of material improvement and by the end of that month the demand had quickened considerably and the prices stiffened. The surplus of coal was utterly inadequate to meet the demand which developed and the car supply precluded the possibility of materially increasing the output. A strong spot market developed and by the latter part of October prices had reached the highest figures that ever obtained in this district. The scramble for the limited supply of free coal grew so strenuous that the price and grade of coal furnished almost ceased to be elements in the situation. On account of the disturbed labor conditions throughout the country there was a general shortage of coal and inquiries were received from territory which had never previously called on this district for its supply. However, the demand in the legitimate field of the district could not be met, and the inquiries from foreign territory had no material influence on prices.

During the year a large trade territory was opened to Alabama mines in Louisiana and Mississippi by an adjustment in freight rates from the Kentucky, Illinois and West Virginia mines to points in these states, effective Aug. 1, 1916. The annual consumption of coal in the new field is estimated at from 1,500,000 to 2,000,000 tons, and a large amount of Alabama coal found its way into this territory during the latter half of the year. There was also a heavy increase in both rail and water shipments to the ports of Mobile, New Orleans and Pensacola, contracts having been secured for supplying the navy yards at these points and also for furnishing coal to Government vessels operating out of these cities.

The outlook for the coal trade in 1917 is considered very bright, all indications pointing to a steady, healthy demand for some time to come. It is expected that the railroads will, in the course of a few months, be in a position to furnish an adequate supply of cars.

The Middle Western Markets in 1916

SYNOPSIS— Demand and shipments of Middle Western coals increased to unexpected proportions and 1916 was a year of unparalleled prosperity. Deficiency of Lake shipments and an abnormal consumption in the Northwest caused a heavy movement in that direction. Shipments were also made as far east as New England and south into Texas. Prices were at new high levels.

Events in the Western coal trade during 1916 have been unparalleled. The usual winter trade of 1915-16 was followed by an unusual depression in the spring months, but the summer and fall months witnessed an extraordinary revival which gained such momentum that in the late autumn it found all grades of coal selling at the highest prices ever known. The principal causes for the tremendous demand during the last six months of 1916 were the great increase in industrial calls for steam fuel, lack of car supply and a decrease in the amount of labor available. Finally, and not by any means the least important factor in causing better returns to Western producers, is the many coöperative operators' organizations now in effect to maintain schedule prices.

Firm Conditions During the Opening Period

During the early part of January, 1916, all grades of coal were moving in good volume. The domestic market showed increased strength, with steam grades on the upward trend. Smokeless coals were in a much better position and the excessive Lake shipments diverted into the Western markets toward the end of the previous year had about disappeared. Illinois and Indiana lump was being sold at around $1.50 to $1.75 with mine-run averaging $1 and screenings about 75 to 85c. A cold snap toward the latter part of January increased the country buying of domestic sizes, and as stocks were at a low ebb many rush orders for coarse domestic sizes were placed. Screenings were exhibiting increasing strength notwithstanding the greater production of coarse sizes and were selling at an advance of from 10 to 15c. per ton. Zero weather in the Northwest also strengthened the demand from that territory, and an increased demand was noticeable for smokeless anthracite sizes. Railroads and industrial plants were heavy buyers of mine-run about this time.

In the early part of February continued severe weather developed an urgent demand for domestic grades, with screenings still a prominent factor in the market at maximum prices. Two distinct cold waves also had an important bearing on the improved condition of the market. But little spot coal was in evidence, and operators and wholesalers were behind on their orders. Loading facilities at the upper Lake docks were strained to the limit by a heavy demand from all directions, and the Western market was in a generally healthy state.

In March mild spring weather appeared and caused a softening in market prices. The outlook with respect to the approaching wage negotiations with the miners was uncertain and many steam consumers began to accumulate surplus tonnage in anticipation of a suspension of mining. Domestic business dropped off suddenly and dealers were attempting to make current stocks carry them over into the summer months. Toward the end of the month it was apparent that no strikes or suspension of operation would occur, and a great many dealers and consumers felt that no hasty action was necessary to renew their supplies.

The Deficiency in Lake Shipments

Considerable sparring as to new prices for contracts developed, but generally steam coals were advanced from 5 to 15c. per ton over the previous year's prices. The car supply at this time was abundant and the movement of coal prompt. The anthracite situation was in an uncertain state, awaiting the outcome of Eastern negotiations, with retailers' stocks light and an absolute indifference shown as to future requirements. Many manufacturers, owing to settlement of wages, commenced using their storage piles, while other steam consumers were only buying minimum amounts for immediate necessities.

In April and May the customary spring depression took place and the larger steam sizes were gradually forced down from 5 to 15c. per ton. Screenings were temporarily inactive and though holding up better than any other size they slumped to some extent. The prospects for the Lake trade at this time were promising, although bottoms were hard to obtain on account of the ore trade being so active. Southern Illinois lump brought from $1.50 to $1.75 in April and May, Springfield district lump $1.40 to $1.65, with the Indiana coarse sizes ranging from $1.45 to $1.65. Screenings were generally averaging during these two months around 85 to 95c. Prepared sizes of Pocahontas coals were moving at heavy concessions and it was hoped that the opening of navigation would afford some relief to the Western situation on smokeless coals.

In June the labor troubles in the Pittsburgh field were a factor in the Indiana and Illinois markets. It was felt that if the Pittsburgh situation did not mend, tonnage in the Northwest would have to be made up from Indiana and Illinois mines. It also shortened the supply of West Virginia smokeless coals at Tidewater and naturally prices were advanced in Western territory. During this month a number of railroad contracts were made with operators at an advance of 7½ to 10c. per ton. In southern Illinois the prices of domestic sizes were marked up 10c. a ton on June 1, making the price on lump, egg and No. 1 nut $1.45. Screenings were a little stronger, averaging from 95c. to $1. The coke market became quite strong at this time and byproduct ovens were easily obtaining $5 to $5.25 for their product. The demand for Indiana coal was light and prices unchanged.

The Stiffening Tendency in Midsummer

Toward the end of June the market improved and the mines were averaging about 40 per cent. of capacity, which was an increase of about 10 per cent. over the same time in the previous year. Prices were averaging from 10 to 15c. higher than in June, 1915, and many consumers showed a disposition to switch from Eastern to Western coals at this time. Spot market prices were firm, with an advancing tendency.

Contracting became the principal factor of the hour. Illinois operators also made an active campaign to extend their markets in all directions. It now became evident that if the operators obtained all the business they had in prospect the railroads would be swamped, although a number of railroad officials had promised the operators that they were making all arrangements necessary to take care of the traffic. The Lake situation toward the end of June tightened up on account of the extraordinary demand for the movement of other commodities, so that there was a scarcity of vessels.

Early in July domestic buying improved, with screenings holding firm, but even at this time a shortage of cars was reported here and there. In southern Illinois the mines were operating about half time and in central Illinois the principal demand was for steam coal, while the Indiana mines were working mainly on contracts. The Western market at this time was inclined to drift into a state of dullness, but much optimism was exhibited as to the future. Shortage of Lake vessels caused the movement of considerable tonnage all-rail.

Demand Increases and Price Advances Appear

About the middle of July a more lively tendency was exhibited. On some grades the demand was heavy at higher prices, especially on steam coals, while domestic demand improved perceptibly and screenings, instead of easing off as had been expected, grew stronger. The mines were operating from 60 to 65 per cent. of capacity, which was exceptionally good time for the summer months. Toward the end of July it became evident that the retail dealer would have difficulty in getting sufficient labor to unload cars and this later became much more acute.

The edge of the fall buying now commenced to appear, although the retailer was still behind normal with his orders. Southern Illinois coarse sizes were sold at this time from $1.55 to $1.75, and Indiana domestic sizes around $1.50. Screenings were strong at around $1. The anthracite trade was dull, but smokeless ordering showed a complete change from the previous lethargy; July was the last month of discount prices on smokeless and every retailer was trying to get some coal.

The buying of coke at this time was heavier than the ovens could satisfy, especially for domestic sizes. Harvesting requirements also created a better demand for domestic sizes from southern Illinois and Indiana than had been anticipated. In the Northwest heavy buying made a sharp drain on supplies at the Upper Lake docks.

Gradual Improvement During the Late Summer

Early in August, despite dull domestic buying, the tendency was to higher prices. Production in Illinois and Indiana was greatly curtailed. Prices for screenings were in the ascendant and ranged from 90c. to $1 per ton. The heat was intense in various Western cities, and deliveries from retail yards to consumers were very slow. The contract situation was more stringent and many small consumers that tried to cover at the close of July were unable to do so because the mines were fully covered by contracts. About two-thirds of the screenings shipments were applied against contracts at this time.

Steam coals became more active during the middle of the month, consumers evincing a disposition to accumulate reserve stocks. Shipments of screenings were limited because of the curtailed output of domestic coal. Some of the large public service corporations, heavy buyers of screenings, who almost fixed the price of fine coal in former days, were now obliged to meet the operators' figure. Operators now showed a disposition to hesitate about making further contracts and this caused many retailers and consumers to become uneasy. In many Western trade centers consumers were told that shippers had no more high-grade coals to offer under contract, and the consumer was forced to turn to low-grade fuels to fill the gap.

It was evident at this time that the shortage of bituminous coal at the Upper Lake docks would be serious. The possibilities of a railroad strike on Sept. 1 also caused a noticeable improvement in the demand for coarse domestic sizes toward the end of August. Trade for all sizes showed considerable improvement, and substantial reductions in the coal held on mine sidings was reported.

The mines increased their running time during the last week of August and urgent calls were made for steam sizes. The great scarcity of these grades continued the leading factor in the situation. Screenings were on an average about 10c. higher than earlier in the month.

All Eastern coals, owing to slow movement, were late in reaching Western distributing centers and circular prices were strictly adhered to. Anthracite trade improved because of the possibility of an interruption of transportation. Buying by retail dealers, who had been holding off on account of the weather for several weeks previous, became much heavier.

An Unprecedented September Demand

Early in September the demand commenced to outstrip the supply, with prices showing a strong tendency to rise much higher. The expansion of trade began to be quite noticeable and domestic buying was perceptibly stronger with the mines unable to keep abreast of the orders for steam sizes. Illinois and Indiana prices were averaging at this time at least 20 per cent. higher than for the same time the previous year. The demand for Lake coal was unusually heavy and much higher prices were anticipated.

Never before in the history of the coal trade had such a sudden buying movement developed as early in September. Even when it was known that a final agreement on the railroad wage scale had been made this failed to effect the coal markets adversely. The trade was so brisk at this time that many large operators withdrew their salesman from the road and supplies everywhere were short, with prices tending to new high levels. Domestic lump was selling at from $1.85 to $2.10 and screenings had risen to $1.25 to $1.50.

Insistent efforts on the part of retailers to cover their smokeless requirements caused premium prices to be paid. Shortage of cars and floods in the Eastern fields had also reduced smokeless stocks in the Western territory. Anthracite became much stronger in the middle of September, and before the end of the month consumers made energetic efforts to make up the deficiency of the previous three months. Movement of coal up the Lakes showed no increase and many calls were made from the Northwest for Illinois and Indiana coal. Southern Illinois coal was advanced Sept. 20 to $2 on lump, egg and No. 1 nut; mine-run, $1.45, with screenings in the open market averaging around $1 to $1.10 per ton. The

strength of the domestic market at this time was mainly due to the fact that retailers were placing heavy orders in an attempt to put their stocks on a normal basis; retailers throughout the West were 60 days behind on their orders.

Reduction in freight rates to Kansas points from central Illinois mines, supplemented by restricted production in that territory owing to labor troubles, opened up a new outlet for Illinois coal. Springfield mines began making heavy shipments of screenings to Kansas City around the dollar mark. Open coke shipments were few, owing to producing companies restricting their output to contracts. Spot coke was sold at premium prices. Shortage of cars and labor at the end of the month caused increased buying on the part of country and city retailers.

The daily press at this time was giving considerable publicity to the advancing retail prices, particularly for anthracite sizes. An increased number of operators reported that they had no coal to offer, and salesmen withdrawn from the road were spending their time helping to obtain cars. Screenings were slightly softer toward the end of September, owing to industrial plants working off their surpluses accumulated in anticipation of a railroad strike. Domestic lump and egg readily brought $2 per ton, and it was evident that in October there would be much higher prices for coarse coals.

Spectacular Price Advances in October

Early in October operators were swamped with such a mass of orders that they became hopelessly behind. Buyers now began to show little inclination to question either quality or prices and their only anxiety was to secure tonnage. Illinois operators began making shipments to points in the Northwest never before reached by them. Prices reached new high levels owing to the stimulation of trade by colder weather and extraordinary efforts made by retailers to secure stocks.

The tonnage moving was largely applied against contracts, so that free coal yielded abnormal prices. Screenings became much stronger and some Illinois operators made shipments of domestic sizes at as high as $3 per ton. Outbound shipments from Lake ports were heavy and country demand in the Northwest showed no abatement. A short car supply developed and operating time at the mines fell off to about 65 per cent. Although the schedule price on lump was $2 many operators were able to secure as high as $2.25 and $2.35 for free coarse sizes. Anthracite was moving heavily from Chicago docks at this time and it was evident that there would be a shortage of hard coal.

Toward the middle of October the most active conditions ever displayed in the Western coal trade were in evidence and occasional flurries of very excited buying occurred. Prices were fluctuating over a wide range and little spot coal was available. The schedule price of lump was $2.25 and mine-run was selling around $1.60 with screenings averaging about $1.10 per ton. The upward tendency of the smokeless market was not retarded; smokeless mine-run was sold as high as $2.50 and lump and egg reached $3.25. Spot shipments of smokeless coal were very scarce and offerings as high as $3.50 for lump and egg were reported.

Shipments of Indiana and Illinois coals were going to Northwestern points in greatly increased quantities at high prices. The shortage of anthracite caused many former consumers of hard coal to substitute Western bituminous grades. Despite this expedient, the demand for anthracite was about as heavy as in former years, due largely to delayed ordering.

By the end of October the deficiency became more acute; steam coal prices reached an unprecedented level for that season of the year and many producers declined further orders for domestic grades. Colder weather late in the month caused a tremendous influx of unsolicited orders and never before at this season of the year had prices on steam coal been as high as they were the latter part of October.

Many large steam users and railroads were conserving their storage piles for protection against a more serious shortage expected when winter weather would be in full swing, and this increased the scramble for free tonnage. Domestic lump was selling at from $2.25 to $2.50 and screenings at from $1 to $1.25 from Indiana and Illinois mines. Stocks of anthracite at Western points were disappearing readily under the influx of heavy orders. An enormous demand was in evidence for smokeless sizes, lump and egg being quoted as high as $3.50, with only a car of spot coal here and there available. Mine-run was readily selling at $3.

New Trade Channels

Owing to the car shortage at Eastern mines, Illinois grades were being shipped to the Northwest in increasing quantities. At this time the Illinois operators also began shipping coal into eastern Indiana and the state of Ohio—something that had not happened in many years before.

Late in October the operators began to quote prohibitive prices, in order to restrict buying, but this policy only seemed to have the reverse effect. The demand became more insistent than ever at the new high levels and a sudden cold snap precipitated a flood of domestic business. The South at this time commenced to buy its winter coal, which accentuated the shortage of cars, because the empties were confiscated by Southern carriers. It was almost impossible at this time to quote fixed prices for open tonnage. Southern Illinois lump was selling around $2.75 to $3.50, mine-run at $1.75 to $2, and screenings at $1.50.

An extravagant range of prices prevailed early in November, with panicky conditions evident in some quarters. Illinois lump was selling at from $3 to $3.25, mine-run $2 to $2.75, and screenings had risen to the unprecedented level of $2 to $2.50. Considerable southern Illinois coal was moving into Michigan at premium prices and it was reported that October showed the largest tonnage ever shipped to the Northwest from Illinois mines. Steam users at this time seemed willing to pay any price to get coal.

The extraordinary situation was due to several causes: Failure of steam users to store coal when it could be had last summer, shortage of Ohio River coal in the South and the small tonnage moved up the Lakes due to shortage of bottoms. The car situation became worse and the heavy movement of traffic other than coal caused the outlook to be extremely uncertain. In the middle of November coal was sold at the mines at figures exceeding the highest prices ever before reached. Differentials as to grades, sizes and quality were entirely wiped out and there was the stiffest kind of bidding for any free coal. Quotations on spot coal were made on an hourly basis.

Stocks were lower in the Western country than in many years past and a number of retailers, having contracts with consumers made before the tremendous advances, were now making deliveries at an actual loss because of their failure to store coal at the lower prices. Lump coal was sold at from $3.50 to $4 per ton, with all intermediate grades yielding new high prices. Mine-run was sold at from $2.50 to $2.75 and screenings had reached the $3 mark. Smokeless tonnage shipped to Western distributing centers in the middle of November was entirely applied against contracts. Any free coal sold readily at $5 to $5.50 per ton.

The situation as a whole was without a parallel and the operators admitted that they were helpless to relieve the tremendous shortage. Lack of equipment was intensified and the distribution of Middle Western free coal continued to spread over still new markets. The demand from the Northwest was of the most urgent character, while an entirely new extension of the market for Illinois coals was opened up in the Southwest by a strike at the Oklahoma mines. Little smokeless coal was offered at this time for sale in the West, almost the entire output being shipped eastward.

The close of the month of November showed new price records established. Unheard-of premiums were paid for a quick shipment of free tonnage. Cold weather further stimulated the market. The demand for steam coals was as urgent as ever before and some industries had difficulty in securing enough supplies to meet requirements.

Inquiries on Illinois coals were received from New York, British Columbia and Texas. Increased shipments of Indiana coal were made to Michigan points and an increased percentage of Western coals was being moved into Eastern territory notwithstanding railroad embargoes on equipment. Open market business on smokeless coals became inactive because of little tonnage arriving. Anthracite was increasingly scarce.

PRODUCTION AND SHIPMENTS

	Tons
Estimated production Apr. 1, 1916, to Mar. 31, 1917	63,000,000
Franklin County	10,250,000
Annual railroad shipments moving from Illinois	23,000,000
Annual railroad shipments moving from Franklin County	2,000,000
Annual commercial tonnage from state	40,000,000
Annual commercial tonnage from Franklin County—over one-fifth of total, or	8,250,000

Below is given the record of Franklin County (nineteen mines) for the four-month period when the operators' offering of coal is perennially neglected by the public generally and no effort whatever made to store coal.

	Week Ending 1916	Percentage Time Worked	Coal on Hand at Mines, Tons
April	29	33.85	103,746
May	6	35.88	93,750
	13	38.67	91,910
	20	33.46	82,222
	27	41.02	75,887
June	3	35.28	68,502
	10	49.34	73,347
	17	42.31	86,034
	24	47.00	84,927
July	1	49.60	66,705
	8	43.75	66,686
	15	55.58	81,724
	22	50.55	76,097
	29	50.55	66,441
August	5	60.32	68,394
	12	61.25	63,034
	19	58.51	31,530
	26	60.46	11,462
Sept	2	76.23	540

At the end of November Western domestic lump was selling at prices from $3.50 to $4.50 as against $1.50 in July; mine-run from $3 to $3.75 as against $1 to $1.15 in July; screenings readily yielded $3.25 to $3.50 as against 90c. to $1 in July; coarse steam sizes were bringing $3 to $3.50 as against $1.25 to $1.35 in July; smokeless coals were selling at $5.50 to $6 for lump and egg as against $1.60 to $1.90 in July; splint and Hocking lump were selling at $4.50 to $4.75 as against $1.75 in July.

The Milwaukee Market Last Year

Consumers of steam coal in Milwaukee and adjacent territory, who have been accustomed to an unvarying supply of fuel at moderate prices, had their feeling of security somewhat shaken last spring by the fact that coal was not coming into this port in the usual volume and that there was a prospect of a shortage and consequent higher prices. Fairly satisfied with the outlook, in view of their own seeming preparedness, leading coal handlers scouted disturbing suggestions of a possible coal famine and gave the public to understand that there was little danger of such an event. However, there was a steadily increasing demand, which, coupled with a scarcity of miners and of coal cars, caused them to alter their views of the situation.

Prices Withdrawn

Naturally, under these conditions, consumers began to grow anxious as to the future, and the demand for coal became more and more insistent, the matter of price finally becoming a secondary consideration. Dock companies used every effort to accommodate all applicants, but those having contracts received first consideration, as a matter of course. Hand-to-mouth buyers were called upon to pay higher prices, which, toward the end of the season, amounted to fully double the rates that prevailed at the opening.

The April price list for coal in cars or wagons at the docks carried an advance of 25c. per ton over the figures of the season previous. Later on, as receivers grew more nervous over the situation, they declined to make contracts at these rates. As the season advanced and stocks became shorter, consumers began to bid prices up in the hope of luring dealers from their contract obligations.

A circular issued on Nov. 1 omitted all but the lump and stove varieties of bituminous coal, screenings and pile run all being listed as sold up. On Nov. 20 all quotations on soft coal were withdrawn by dock companies. The market continued in this chaotic condition for the remainder of the year, with the prospect of even higher prices before the opening of navigation in 1917, should present stocks become exhausted and have to be replenished by rail.

Winter Supplies Inadequate

The flow of coal to interior points was very heavy all through the year, and toward the close of the season shippers experienced great difficulty in securing cars to handle this trade. On Nov. 1 the leading dock company was 60 days behind in its deliveries to outside points.

The hard-coal situation was not so strenuous. Consumers, however, were called upon to pay one dollar more per ton than last year, because of the increase in the cost of every element entering into the fuel-handling business. There is little fluctuation in the demand for hard coal from year to year, and while the receipts show a falling off of over 150,000 tons as against last year,

there will be no difficulty in procuring supplies of the household varieties if the winter proves moderate.

Milwaukee's annual coal supply by Lake and rail averages a little over 5,000,000 tons, about half of which is consumed in the city and immediate vicinity. The receipts by Lake and rail during 1916 totaled 4,814,285 tons, against 5,058,362 tons in 1915, a decrease of 244,077 tons, the shortage in hard coal being 219,754 tons and in soft coal 24,323 tons. The port records also show receipts by carferry to the amount of 359,824 tons, but these latter receipts connot be credited to Milwaukee yards as practically all the carferry freight simply passes through the city to points West.

Factories everywhere are working double time, which means a double consumption of fuel, so that a supply that would be sufficient for a normal season will not go round unless it can be augmented materially by rail during the winter. If the present demand for steam coal continues, the amount of free coal, or coal not needed to cover existing contracts, will be exhausted by the end of February, when the open market will have to depend upon rail receipts.

Changes in Coal Companies

The year was marked by the retirement from business of the Pennsylvania Coal and Supply Co., which for years was one of the leading coal-handling companies of the city, maintaining three river dock yards and several supply depots along railway lines at remote points from the rivers. The Sixteenth St. dock has been taken over by the Milwaukee-Western Fuel Co.; the Whitnall dock, just opposite, on the south side of the Menominee River, is now operated by the Kanawha Fuel Co., whose other docks are immediately adjoining, and the Independent dock, near the harbor entrance, now belongs to the Wisconsin Coal and Dock Co., which also maintains a dock yard on the Menominee River. The Whitnall Coal and Supply Co. is a new organization which was formed by members of the defunct Pennsylvania company. This company is without dock-handling facilities, however.

There is considerable activity in the coal dock district in the way of repairing and rebuilding docks, etc., which indicates that operators are looking forward to increasing business during the coming year.

The following rates were current on coal loaded on cars or wagons at the yards up to the time all quotations were withdrawn.

	Apr. 1	Nov. 1
Pittsburgh and Youghiogheny		
Lump and nut (screened)	$3.65	$5.00
Lump and nut (pile run)	3.35	*
Screenings	2.75	*
West Virginia		
Lump (screened)	3.65	5.00
Lump (pile-run)	3.35	*
Screenings	2.75	*
Kanawha gas (mine-run)	3.15	*
Splint lump (screened)	3.65	5.00
Splint lump (pile-run)	3.35	*
Stove (screened)	3.65	5.00
Stove (pile-run)	3.35	*
Screenings	2.75	*
Pocahontas Smokeless		
Mine-run	3.65	5.00
Screenings	3.00	*
Hocking		
Lump (screened)	3.65	5.00
Lump (pile-run)	3.35	*
Stove (screened)	3.65	5.00
Screenings	2.50	*
Smithing	4.50	5.25
Smithing (sacked)	6.50	8.00

* Sold up. All quotations drawn Nov. 20.

Coal-Trade Conditions in the Southwest

The high prices quoted at wholesale for domestic coals marketed in the Southwestern states such as Arkansas, Louisiana, Oklahoma, Texas, southern Kansas and New Mexico lately, has caused considerable unfavorable comment by the public press, retailers and consumers, but the operators feel that the responsibility for the high cost of fuel mainly rests with the consuming public. The necessity for domestic sizes is only felt during the short winters prevailing in these states and neither the retail yards nor the consumer have ever shown any inclination to store coal in the summer months, when it can be obtained at lower prices.

Quotations on Oklahoma and Arkansas coals, the principal domestic production of the Southwest, reached unprecedented high levels in December and were approximately as follows during the year 1916, f.o.b. cars at mines:

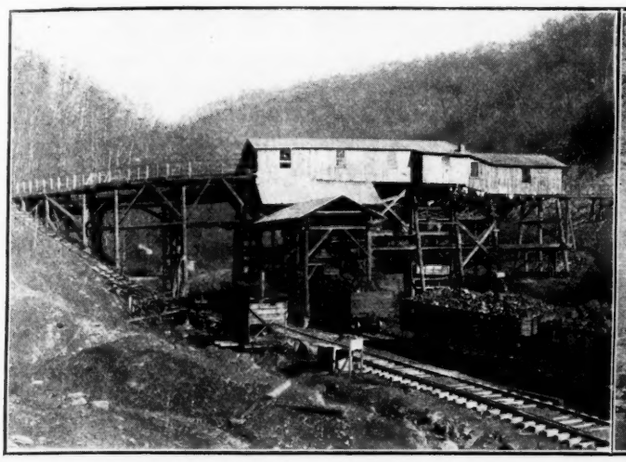
	Dec.	July	Apr.
McAlester domestic lump	$5.50	$3.90	$3.50
Wilburton domestic lump	4.50	3.55	3.25
Coalgate fancy lump	4.00	3.30	3.00
Henryetta-DeWar domestic lump	4.00	2.90	2.75
Bokoshee-Howe domestic lump	4.00	2.50	2.50
Greenwood-Hackett-Huntington domestic lump	4.00	2.50	2.50
Denning lump	4.00	2.50	2.50
Bernice (Ark.) semi-anthracite, grate	4.50	4.05	3.60
Bernice (Ark.) semi-anthracite, egg	4.75	4.30	3.85
Bernice (Ark.) semi-anthracite, stove	5.75	5.00	4.25
Bernice (Ark.) semi-anthracite, pea	3.50	3.30	3.00
Fernwood (Ark.) semi-anthracite, grate	4.75	3.80	3.50
Fernwood (Ark.) semi-anthracite, egg	4.35	3.80	3.50
Fernwood (Ark.) semi-anthracite, pea	3.00	2.50	2.50

It is generally conceded that the best domestic coal in the Southwest is produced in the McAlester field in Oklahoma. Here the coal is mined at a great depth—from 500 to 600 ft.—with new shafts projected to reach the vein in the bottom basins at 900 ft., which causes the expense of production to be quite high, but not exceeded anywhere in quality. The coal mined at Dawson, N. M., is also high in quality but not so expensive to mine.

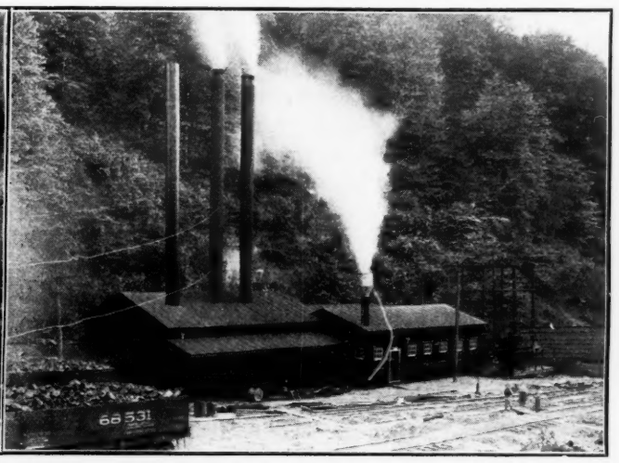
The coal industry of the Southwestern states has been hard driven to operate profitably during the past several years and a number of companies have gone into bankruptcy. The production of Oklahoma is estimated to be approximately 2,750,000 tons in 1916, as against the high-water mark of 4,161,000 tons in 1913, and is probably less in 1916 than in any year since 1905. Arkansas will probably produce 1,500,000 tons in the year 1916, as against 2,670,000 tons in 1907, its best year. New Mexico in 1916 will probably produce 4,000,000 tons and will make a much better showing than some of the other Southwestern states, owing to the steady absorption of its output for coking purposes, railroad-engine use and increased domestic consumption. About one-quarter of the total amount of coal produced in New Mexico is made into coke, which is produced in Colfax County.

When the strike at the Oklahoma mines occurred on Nov. 1, the operators were about two weeks behind on their orders. Since that time they have not been able to catch up with the demand. The shutdown of the mines lasted about two weeks, when the miners were granted all the concessions asked for. This caused an increase in the cost of production averaging from 18 to 25c. per ton. Every mining company in the Southwest no doubt sustains heavy losses between Mar. 1 and Sept. 1 of each year, owing to the absence during this period of any call for steam or domestic sizes.

Snapshots in Coal Mining



TIPPLE OF EASTERN COAL CO. NEAR HAZARD, IN PERRY COUNTY, KY.



POWER HOUSE OF KENTUCKY RIVER POWER CO., NEAR GLAMOURS, KY.

GANGWAY AT THE BURNSIDE COLLIERY OF THE PHILADELPHIA & READING COAL AND IRON CO., SHAMOKIN, PENN.; ROOF SUPPORTED BY CONCRETE TIMBERING

Shaft Sunk 252 Ft. in 31 Days

What is claimed to be a world's record in shaft-sinking was made by the Crown Mines in its No. 14 shaft, located in the Boysers Reserve on the South African Rand. According to A. Cooper Key in the *Engineering and Mining Journal*, in the 30 days of September and the first day of October, this shaft was sunk 246 ft. and 6 ft. respectively, totaling 252 ft. It is circular, 21 ft. 6 in. diameter before bricking, 20 ft. inside lining.

The sinking was done with the aid of 30 natives, working 90 shifts. Five Ingersoll-Rand machines were used per shift. To break the 9,120 tons of rock excavated, 67 cases of gelatin were consumed. This rock was hoisted in a 3-ton bucket, the hoisting being done by one steam engine connected with two boilers.

The previous sinking record was made by the Modder Deep Levels in April, 1912, when 234 ft. was sunk in one of the twin shafts. This shaft had three compartments, two measuring 5x6 ft. and one 6x6 ft. The Modder Deep beat the record created a month earlier in the southeast shaft of the Modder Government Gold Mining Areas by the narrow margin of a foot. This, in turn, was an advance from the 213 ft. of the Modder Deep constituting the previous record. Previously the best record was that of the Brakpan Mines, made as far back as July, 1907.

The 1912 records, now surpassed, were made at a depth of 2,000 to 2,500 ft., whereas the total depth of the Crown Mines new shaft is about 1,000 ft.

Safety Work of Mines' Bureau in 1916

By Van H. Manning*

The mine safety work of the Bureau of Mines has been handicapped during the calendar year because three of the eight mine-rescue cars formerly in operation had to be permanently withdrawn from service on account of their condition, while the remaining five were so badly in need of repair as to necessitate temporary withdrawal from active service. At present these five cars are in railroad shops undergoing repairs, but will be available for service early in 1917. Three all-steel cars, now under construction, will replace the three cars permanently withdrawn from service. These new cars will be assigned to the West, with headquarters respectively at Raton, N. M., to serve Colorado, New Mexico and Southern Arizona; at Reno, Nev., to serve Nevada, Utah, California and Northern Arizona; and at Butte, Mont., to serve Montana, Wyoming, Idaho and other northwestern states. These cars will be put into commission about April 1, 1917. In addition to the two rescue motor-trucks which have been in service for some time, another truck, similarly equipped with rescue apparatus, was recently purchased for the Seattle, Wash., station.

Because of the foregoing condition, practically all the mine-rescue and first-aid training has been done by men on detached service who have gone from town to town. Obviously, no equipment, except that absolutely essential for training purposes, could be carried, and the work did not, perhaps, attract the same number of men nor receive the same publicity as when the cars were in use. However, during the calendar year 1935 miners were completely trained in both mine rescue and first aid, 478 miners in mine rescue only, and 4611 miners in first aid only—a record which compares favorably with the records of previous years.

In this work an average of 17 men were employed who conducted training in 28 states and 340 towns. In addition, these men and engineers of the Bureau gave lectures and motion-picture exhibits illustrating subjects of interest to the miner, and assisted in organizing and conducting first-aid and rescue meets and in investigating mine disasters. In short, their entire time was spent in studying and advancing the cause of safety and sanitation in mines and mining communities.

Numerous tests were made with different types of rescue apparatus. Some very successful results were obtained with the Gibbs oxygen rescue apparatus, designed under the supervision of the Bureau of Mines' engineers, which gives promise of fulfilling every expectation. A contract has been let for twenty-five of these apparatus for field use.

J. W. Paul, in charge of this work since the Bureau was first organized, resigned in February, 1916, and was succeeded by H. M. Wolflin. Mr. Wolflin served until November when he was assigned to coöperative work in California, and was in turn succeeded by D. J. Parker as mine-safety engineer, with headquarters at Pittsburgh, Penn. An average of 25 men are employed under him. For convenience of organization, the coal fields are divided into districts, the district headquarters being at Pittsburgh, Penn.; Huntington, W. Va.; Jellico, Tenn.; Birmingham, Ala.; Evansville, Ind.; McAlester, Okla.; Ironwood, Mich.; Pittsburg, Kan.; Butte, Mont.; Raton, N. M.; Reno, Nev. (which, while taking care of the metal mines, will also reach the coal mines of Utah); and Seattle, Wash.

*Director, United States Bureau of Mines, Washington, D. C.

New York City's Fuel Bill for 1917

More than $1,500,000 has been included in the city budget for 1917 for the purchase of fuel for the various city departments. About the only decrease is in the Department of Water Supply, Gas and Electricity. This is due to the completion of the Catskill water system, which will be put into operation on Apr. 1 when most of the pumping stations now in use will be shut down.

This branch of the city government has been using in the neighborhood of 160,000 tons of coal yearly. Of this amount about 74,000 tons has consisted of buckwheat No. 1 and about 20,000 tons of buckwheat No. 3, the remainder being bituminous. This year the total consumption is not expected to exceed 65,500 tons, 40,000 tons of which will be needed the first three months of the year, or until the new water system is in operation.

The appropriations made for the various departments for this year include the following:

President:		Armory Board	$30,000.00
The Bronx	$10,716.00	Health Department	84,000.00
Brooklyn	67,380.00	Plant and structures	2,705.00
Queens	26,800.00	Municipal garage	350.00
Richmond	7,915.00	Docks and ferries	245,273.00
Manhattan	95,486.00	Water supply, gas and electricity	76,738.00
New York City College	26,554.00	Street cleaning	10,160.00
Hunter College	2,363.00	Public charities	270,218.00
New York Library	13,000.00	Bellevue and allied hospitals	100,000.00
Brooklyn Library	10,386.00	Board of Education	459,217.98
Queens Library	2,260.00	Board of Inebriety	1,500.00
Parks:		Sheriff, New York County	650.00
Manhattan and Richmond	14,105.00	Sheriff, Richmond County	1,400.00
Bronx	4,813.00	Children's Museum, Brooklyn	450.00
Brooklyn	13,322.00	Brooklyn Botanical Garden	2,250.00
Queens	2,499.00	Brooklyn Institute of Arts and Sciences	7,800.00
Police Department	53,787.00		
Fire Department	118,740.00		

"Bumps" in British Columbia

The word "bump" has been interpreted by many as a buckling of the floor or of the walls of mine passageways. But that is not its true meaning, for the word is really synonymous with "jar." It has its origin in the shocks accompanying earth movements. George S. Rice, chief mining engineer of the Bureau of Mines, believes the word has an English origin, because it is not in common use among the miners in this country.

Mr. Rice has been investigating these bumps in British Columbia on invitation of the Minister of Mines of the Dominion of Canada. He believes that they offer no insurmountable obstacle to the continuance of mining operations in the Crowsnest coal fields.

Mr. Rice admits, however, that there are more adverse natural conditions in these mines than in any others with which he is familiar. He made exhaustive examinations at a number of mines in company with Thomas Graham, the mine inspector for British Columbia, and with W. F. Robertson, provincial mineralogist.

Not only is the coal that is mined in the Crowsnest district of good grade, but it is an important source of supply for American railroads and smelters. In fact the Crowsnest Pass Coal Co. is said to be a subsidiary company of the Great Northern R.R. Apparently, British Columbia does not fear monopoly, as the railroad was allowed to select over 200,000 acres of land in the most important coal field in British Columbia, thus insuring the opening up of the region. Incidentally, the opening of this coal field has been of material advantage to smelters in the northwestern part of the United States, which are large consumers of the excellent coke that is made from Crowsnest coal. The Bureau of Mines has another reason for being anxious to learn as much as possible of the means of combating these phenomena, for similar occurrences are taking place in the Mount Rainier coal fields of Washington.

Cause Abandonment of Work in Lower Seam

In 1907 and 1908 a series of bumps occurred in the Crowsnest district, accompanied by outbursts of gas. This resulted in several fatalities and was the direct cause of the abandonment of work on the No. 2 coal seam. Mr. Rice believes that the great thickness of the covering material has much to do with the earth movements that are responsible for the bumps. In the No. 2 seam the pressure on the pillars is no less than 5000 lb. to the square inch.

Another bed of coal somewhat nearer the surface was opened following the prohibiting of further work on the No. 2 seam. A strong shale at this point formed a splendid roof. Work on this No. 1 seam was laid out systematically and with special care to prevent the disasters of the lower bed. Only 25 per cent. of the coal was excavated. For some time after the opening of the No. 1 seam there was complete immunity from bumps, but from Nov. 7 to Nov. 13, 1916, several severe ones occurred. Due to the fact that the first bump took place at night, the lives of but few persons were endangered. Great falls occurred, however, and the inner workings of the mine are still inaccessible.

A striking feature of the recent damage in the upper mine, Mr. Rice states, is that the bumps occurred in an area coinciding with that in which they took place in the lower workings.

Recollections of a Mine Manager

Some motormen quickly learn that it is possible to charge a trolley locomotive, and all the iron work in the car bodies of the trip coupled to it, by simply getting enough sand between the locomotive wheels and the track; others never seem to learn the trick. Unfortunately, the ones who are mischievously inclined discover more readily the possibilities of the locomotive as an instrument of torture.

The fact that an electric current of high voltage can not be handled with impunity seems to have little weight with the practical jokers; there are some who are so reckless that they are even willing to take chances with dynamite and gas pockets.

At one of our mines there was a motorman who made it a practice to give every new man who came to work for the company a shock, as a part of his first ride on the man trip; he was able to do this because he was in league with several miners, who kept a sharp lookout for all new men at the plant.

One man in the plot would signal the motorman. The others, crowding on either side of the unsuspecting victim, would jostle him along until he managed to touch one of the car frames. This practice was kept up for nearly a year without attracting the attention of any of the bosses; eventually, however, the jokers came to grief.

One day one of the conspirators stumbled and fell against a car as he was steering a victim to his fate. As a result he received such a shock that all the energies of the first-aid crew were required for more than an hour ere signs of life made their reappearance. Before consciousness had been restored, the motorman involved lost his nerve. Deciding that things would never be the same for him again around that mine, he left for parts unknown without even going to his boarding house for a change of clothes.

The victim was finally brought back to consciousness, apparently none the worse for the experience. A few weeks later, however, he died of heart failure. The camp physician insisted that there was no connection between the shock and the man's death, but the miners thought otherwise and spread the news through all the mining camps in the state.

Many mining superintendents in the state had been endeavoring for years to stamp out practical jokes, with but poor success; as the news of the events that had occurred in our camp reached these superintendents, brought by word of mouth by excited miners, they began to realize that the time was ripe for concerted action. Almost immediately a call was sent out for a conference of superintendents. I attended the conference and was astounded by the statements made by several of the men who attended the meeting.

Thinking that a little publicity might be of advantage, a newspaper reporter had been invited to attend; he remarked as he was leaving the meeting that if he were to write up all the narratives he had listened to just as they were related, his editor would insist that he had drawn on his imagination. He could understand how a driver boy might be tempted to test a mule's kicking ability once in a while; but that a grown man could take chances with such things as high-pressure air lines and dynamite and gas, just to see a man jump, was almost inconceivable.

Labor Developments in 1916

SYNOPSIS—While there is a tendency toward constructive thinking in regard to wages, there is still evidence that the purpose is merely to resist change. The union is composed of diverse elements and is not to be judged as a whole.

The year 1916 exhibits clearly that the mine worker is disposed to elect to the highest offices men of intelligence and integrity and to keep them in office. A union of such a character would seem to be a distinct asset to the industry. It should give stability to the business and character to the worker.

But, unfortunately, the men who with relative unanimity vote for such officials are not disposed to follow them after they are elected. And what is worse, after the men have ratified in the most personal way the contracts made for them, have accepted them in referendum, they are disposed to rebel against them and want them revised. And this revision they want even in cases where they cannot allege and do not allege any change in conditions from those under which the contract was made and provided.

This undoes much of the good derivable from the selection of able leaders. In fact these men, while not utterly without power, or influence or willingness to use it, cannot succeed in doing those things which our knowledge of their probity would lead us to expect of them. They fall far below their declared principles, and their exhibit of virtue does but clothe the contract-breaking quality of the rank and file with a gloss which tends to convert unionism into hypocrisy. It puts the union into the position of promising all sorts of honorable performance yet failing to keep its pledge whenever someone suggests a protest.

Difference Between International and Local

It is hard to write about coal-mine labor matters, because it is difficult to separate the idealism of the mine workers' leaders from the materialism of those same mine workers when voting on local affairs. It would seem that in selecting national leaders and in voting in referendum, the electorate is conservative; but when voting in the local union on the affairs of the moment, the openness of the vote causes the better disposed men to follow the dictates of the violent and irresponsible.

It is not chance that puts the better men in high places. They are truly the choice of the electorate. It is not by peradventure that wage scales are accepted. The men really desire their acceptance. But when matters come before the local union the minority—vocal, aggressive, demonstrative, even violent—coerces all those silent elements which elect the principal officers and promulgate the wage scales, but which cannot succeed in seeing that either officers or scales are followed and obeyed.

Hence it happens that the operator has to be exceedingly patient and to appeal from the local voting in the open meeting to the district or international union voting by written ballot. The mine owner has the local union with its active and too often unscrupulous pit committee so close to him that he cannot think of unionism as an international entity. What does it matter how straight a man John P. White may be if Michael O'Harrity is agitating for the reinstatement of a man who has been dishonest, a danger to the mine and a breeder of suspicion without cause.

The whole history of 1916 has been one of violations by the mine workers of the contracts they have made. These violations have all been local. Attempts have always been made by the officials of the union to squelch these unauthorized walkouts, except perhaps in the matter of strikes against the employment of nonunion men—button strikes as they are called. But such attempts have usually been failures, so it is not strange that operators become sarcastic and bitter when something is said as to the essential soundness of the union as exemplified in the leaders and in the vote of those who elect them.

What Causes Delay in Signing of Contracts

Most of the biennial contracts last year should have been made before Apr. 1, but not a few things intervened to delay matters, principal among which was the fact that there were two main contracts to be completed and that both these had to be made by the international officers.

However, these contracts were both complicated by problems other than those of wage, and furthermore in the bituminous region, when the main contentions were settled in interstate conference, there were still a multiplicity of smaller matters to be adjusted in further district and subdistrict agreements. What complicated the early negotiations in the anthracite region was the demand of the mine workers for an 8-hr. day, and in the bituminous region it was the demand for a universal run-of-mine provision.

Next year it is to be feared the mine workers will be looking for the 7-hr. day. If this is so, it is likely that the work of making a contract will be unduly protracted, as in the year past. But at least the run-of-mine provision will be out of the way. Still there remain difficulties just as likely to make trouble—pushing problems in low coal, safety provisions in gaseous mines and the store and powder question. The miners want pay for pushing coal; they are disposed to ask a readjustment when electric lights and permissible powder are introduced; they want the store prices, the rents of the houses, the charges for coal, powder and squibs kept unchanged. All these demands are likely to make trouble and delay the making of a contract.

But surely next year the operator should not come forward with a proposition as bald of reason as in 1916: "We have not been making money and we cannot raise wages one cent." Especially was this a poor argument in the bituminous districts. The failure to make money had absolutely nothing to do with the wage rate.

If wages went up, the price of coal was bound to rise accordingly, no matter how desperate competition might become. The operator should have come with a truly constructive program and should have advertised it to the world just as the anthracite people advertised their contention. The mine owner should have ascertained the average cost of living, including rent for the period between July 1, 1913, and Jan. 1, 1914, and then the average cost of living for the period between July 1, 1915, and Jan. 1, 1916. Having these, the percentage increase in cost of living should have used on the rate paid in the district

which had the highest rate and which was of sizable proportions.

The calculation could have been regarded as the differential on which the contract was to be based. All wages might have been increased equally by that amount. This solid economic method would have been far better than the senseless "Nothing doing" which characterized too many of the operator's utterances.

The trouble last year—the trouble always—is that we have no program except to try and hold on to past rates, regardless of new conditions. This practice makes the public think that the operator is always wrong in his contention, whereas he should always have a solid basis for his arguments.

The mine worker is surely entitled to maintain his social status. He barely does that with a wage increase that accords with the cost of living, for the workingman is slowly getting a little more *real* wages every decade. His wages should and do enable him to purchase a few more commodities and comforts every year than he could the year before. The growth is slow and must be slow. But it is absurd when making a new contract to thrust the mine worker back and say, "The cost of living has gone up and the production of labor increases, thus providing more comforts for all, but we cannot give you even your old purchasing power."

That may be reasonable where the public puts an injunction against a rise in price of the product of the workman. It cannot be true so long as the public allows the price to fluctuate, as has the price of bituminous coal.

In what precedes it has been said that wages should fluctuate with cost of living, with an addition to correspond to the increased productiveness of human labor. As a matter of fact, the correct rule would be to base increases of wage in any one industry on the average in other industries. But such averages are not available, unfortunately, though they should be immediately collected.

Strong Position of Anthracite Operators

The anthracite operators conciliated the public by their strong defense in the papers of their economic position, by their readiness to supply information to the press and by their immediate compliance with the demand of the mine workers that they treat with them in the formulation of a wage scale. They stand now even more solidly with the public than ever, owing to their steady refusal to be drawn into the runaway market. Anthracite has perhaps been even scarcer than bituminous coal, but the larger operators have tenaciously stuck by prices based on cost of production. The whole sentiment of the people is changing and with careful cultivation the public's attitude will change even yet more.

Another interesting point has been the recognition of the specific as against the percentage raise—a change which leaves all the fields unaffected as regards their competition. Only western Kentucky, Wyoming, Washington and the Pittsburgh region were exceptions to that rule, the first receiving no increase, Washington and Wyoming getting less than the standard and the Pittsburgh region having to give more than the standard increase on machine-mined coal.

Unfortunately, when day labor received its increase it was not an increment of so much per hour, but a percentage increase. This is wrong. The wage rate for mine labor should be changed so much per unit of actual working time everywhere throughout the country. In that way a great step would be taken toward the maintenance of differentials. If this rule is not followed, the one that should take its place is to grant the largest specific increases where wages are least. This plan is precisely the opposite to that obtaining where the percentage increase is uniform all through the industry.

Nothing was done in a contractual way during the past year to make the operator anxious to increase the power of his miners to produce coal. He has been sufficiently urged to such action by the scarcity of labor and by the high price of fuel. He has given the miner, therefore, the squarest kind of a deal, but there may come a time of scanty business and excess of labor, and then miners will hang around the mines waiting for cars.

Psychological Reason of Short Work Day

Operators with low materialistic ideals will hire men for the profit at the store, for the house rent receivable, in order to have men ready for more prosperous times and with the idea of securing better discipline. It would be well if arrangements could be made which would make that mine more profitable that employed least men to secure a given tonnage. Much of the slackness of the mine worker and much of his disposition to short hours is due not to his innate love of ease, but to the bad habits which have been inculcated in him by the small opportunity for work.

If he normally worked steadily, he would get the habit. He would work every day, for eight hours, and would even expect to work every minute of the time. It is the unsteadiness which has been forced on him, partly by the fault of the operator, partly by the seasonal character of the business and partly by the irregularity of service of the railroads, which has made him the "piecing," home-going and absentee workman he too often is.

The teacher who succeeds in developing attentive scholars is the one who keeps his pupils busy every moment. The operator, who has workers, is the man who gives them the means to work every day, eight hours every day, and every moment of the eight hours. But what does the operator care? He, as a rule, gains little by his men working regularly, because the scale is set on the amount of work done and not on the time taken to do it. He will never do his duty so long as the condition continues. It is to be regretted that 1916 came and went without any consideration of this question.

Unfortunately, in the Pittsburgh district the operators tried to better their position by an interpretation of the basal contract which its terms would not bear. The president, Van Bitner, assented in an evil hour to the modification. The mine workers protested and finally ousted Van Bitner and secured their demands.

Fortunately, it is now so clear that the cost of powder is one of the miner's costs of production, that the party most active in traversing the idea is now most forward in demanding its enforcement. One of the officials of the Pittsburgh Coal Co. recently decided that the cost of powder must be regarded in Iowa as one of the costs of production which under the contract may not be increased in any subsidiary agreement.

Probably, therefore, there will be no trouble regarding this matter in the future. Powder, fuse, rent and house coal are all likely to appear in some way in the basal contract, as matters left open for further adjustment or as quantities not to be modified in subsidiary agreements.

The Labor Situation

General Labor Review

The mine workers of the Delaware, Lackawanna & Western R.R. are disposed now to take a reasonable attitude relative to the explosive question, and a strike is hardly likely. The company acknowledges that the principles for which the miners are contending are those which the contract requires. It declares that it is and has always been quite ready to abide by these principles. Thus, there can be no conflict except as to the facts, and these can be settled satisfactorily by the conciliation board, or perhaps without it.

The Delaware & Hudson Co. has done away with the contracting system, to the great delight of the men employed by it. Every man will henceforth be employed directly by the company.

At Bens Creek, near Lilly, in Cambria County, Penn., about 250 miners have gone out on strike, not being satisfied with the 10 per cent. bonus recently granted in central Pennsylvania. The Shoemaker Coal Co.'s strike at Portage, nearby, was settled by a declaration that the 10 per cent. bonus would henceforth be paid.

In District No. 5 (the Pittsburgh district) everything seems peaceful, though efforts are still being made in some parts to have 50 local unions petition for a convention to ask for or demand an increase or a bonus above the contract wage scale. Only 10 locals have so far voted in favor of the proposition.

Meeting at Columbus To Provide for Bonus

However, it is likely that the move will be accelerated by the action of the Ohio mine workers at Columbus. In a resolution they ask for the calling of an interim meeting of the interstate conference, or failing that, a meeting between the Ohio miners and operators, the purpose being to secure a bonus. They declare that any bonus given will not be held to be a change of scale. When next year's contract is made the rates will be determined on their merits and not on the basis of the scale plus the bonus.

The miners seem doubtful whether they can induce their international officials to consider for one moment a plea for the modification of a scale which they signed only about eight months ago and which has 16 months yet to run. The language calling for a convention is carefully framed so as to avoid the suggestion of defiance and threat.

At the Columbus meeting the Ohio miners asked the legislature to make mine supervision in Ohio independent of the industrial commission, which now has jurisdiction.

The United States Coal and Coke Co. at Gary, W. Va., a subsidiary of the United States Steel Corporation, has just announced an increase of 10 per cent. to its 4000 employees, to become effective from the first of the year.

International Board Sits at Indianapolis

On Jan. 9 the members of the international board of the United Mine Workers met at Indianapolis, Ind. The board in moderate language declared against the bonus system, stated that the mine workers were not to blame for the shortage of coal or its increased cost and resolved that the board favor the putting of an embargo on "wheat and other foodstuffs if other means or measures cannot be found by which the present menacing high cost of living can be reduced to a normal basis."

The question of combining District 8, the "block" coal district of Indiana, and District 11, the "bituminous" coal district of the same state, is under discussion. The two regions have different conditions, a different market and a different scale, so two separate contracts are needed, and nothing but the small size of the "block" field seems to justify consolidation.

A strike is threatened in Weld and Boulder Counties, in the northern part of Colorado, northwest and north of Denver. The mines included in the proposed strike are the Frederick and the Grant, of the Rocky Mountain Fuel Co., and the Baum, Russell, Evans, Slope and Firestone mines, which are operated by independent concerns. The fuel company gave all men who work steadily a bonus of 5 per cent. from Dec. 16 of last year. The law requires the mine workers to give 30 days' notice before striking. A written demand has been made on the operators of the seven mines, and meanwhile the demand for increased pay will be arbitrated through the industrial commission of the State of Colorado.

In British Columbia and Alberta the miners some time ago demanded an increase in wage of 25 per cent. in excess of their contract wages. They agreed to await a governmental investigation, and a conference was called at Ottawa, at which the Government, mine workers and operators convened. It has resulted in a deadlock. The Government commission reported an increase in the cost of living of approximately 10 per cent. The miners will not accept any smaller increase.

The operators declare that they cannot concede any change in wage whatever, unless the two principal consumers of the coal—the Canadian Pacific Ry. and the British Columbia smelteries—be made to pay a higher price or the Government pay the increase in wage itself. The smelteries are largely occupied with war contracts, and it will be interesting to see what stand the Government will take should the contending parties fail to agree. There has been some talk that in that eventuality the Government will take over the mines, but this has been denied from Ottawa.

Contracting in Anthracite Mines

Contracting was quite general at the Langcliffe, Laflin, Delaware and Pine Ridge collieries of the Delaware & Hudson Co. until the first of the present year. The miners, instead of working directly for the company, worked for a contractor. He had to pay them the day wages provided in the agreement between the union and the company. All earned above that he received as compensation for his services. The miners have long desired to work uniformly on the piece system and to receive pay according to the work done, but hitherto have not been able to get the company to assent to their wishes. At the Pine Ridge colliery, practically all the miners were employed by contractors.

Rightly or wrongly, the miners have fought this contracting system tooth and nail. President Dempsey, of District No. 1, made it a leading fight at the New York City negotiations, as the "Coal Age" columns repeatedly stated. However, he could not get a clause forbidding it inserted in the agreement. But that did not prevent the mine workers of the Delaware & Hudson Co. from fighting the system, and about the first of the year General Superintendent Cadwallader Evans, Jr., did away with the practice, replacing it by direct employment.

Nitroglycerin or Ammonia Powders?

The powder question has been at a bitter stage at the mines of the Delaware, Lackawanna & Western R.R., Coal Department. Some of the powder that the company is supplying is a safety explosive with an ammonium-nitrate base. The miners contend it is not so effective as the nitroglycerin explosive previously furnished, and believe that it has been substituted in order to meet the demand for an explosive cheaper than the nitroglycerin article so that the loss to the company on the powder supplied will be somewhat reduced. The company declares that the powder properly used is as effective as that which it has replaced and that the purpose of the introduction was to secure a more safe explosive.

The problem is one eminently suited to determination by the conciliation board if the district board cannot settle it with the company. A settlement at present writing seems quite likely. A strike would not only be a violation of the contract but an injury to the men. Apparently the State Mining Department was responsible for the introduction of the powder. Maj. W. W. Inglis, the general manager, states that for general purposes the ammonia powders are as good as dynamite. Where stronger blasts are necessary, the company will furnish the powder best suited to the work. He pointed out that many experts declare the ammonia powders do as good work as dynamite and are much safer. The company, he stated, was prepared to live up to its contract by not increasing powder prices and by not supplying a powder of a character which will reduce the earning capacity of the men or make their working conditions less safe. Black powder is for the most part still in use in the mine and its quality and the price to the coal miner have not been changed.

Strike Against Right of Discharge

At Washington No. 16 colliery, owned and operated by the Lehigh & Wilkes-Barre Coal Co. at Plymouth, a mule driver was discharged on Jan. 4 because he had permitted one of his team of mules to be killed by what was alleged to be gross carelessness. The next day the other drivers gathered at the barn where the mules are stabled and decided not to harness them, but to go on strike unless the discharged man was reinstated. The foreman refused to comply with the demand and the mine was idle that day. The other employees were not in sympathy with the drivers as they believed the discharge was fully warranted, and they threatened to take the places of the striking men if they refused to go back to work.

Central Pennsylvania Grants a Bonus

The Association of Bituminous Coal Operators of Central Pennsylvania met in Clearfield on Jan. 5 and granted a bonus of 10 per cent. to all the employees of the constituent companies, dating from Jan. 1, 1917. The bonus is not an increased wage, being contingent on the maintenance of the high cost of living and revocable at the will of the association. It is not a modification of the contract signed on Apr. 15, 1916, which runs till Apr. 1, 1918. The association makes the proviso in granting the bonus that should any employee strike, suspend work or shut down any mine, the operator by whom he is employed shall have the right to suspend payment of the bonus on unpaid wages.

The association comprises all the operating companies in central Pennsylvania that have a contract with the union. The district involved is that known as No. 2. It made a separate contract with the United Mine Workers of America, refusing to take part in the interstate conference. Richard Gilbert, the secretary-treasurer, stated at the convention preceding the conference at which the present scale was adopted, that the number of union men in the district in 1915 was 38,066. This number has probably been increased by the forming of new local unions and the enlargement of the territory controlled by the union. It is hardly probable that disaffection or indifference has balanced the large number of new recruits. The bonus, therefore, affects at least 38,000 union men, and a number of nonunion employees will also profit by it. In fact it is estimated that the beneficiaries of the bonus will aggregate 45,000.

Berwind-White Gives 10 per Cent. Increase

An advance was also granted by the Berwind-White Coal Mining Co., which employs 6500 nonunion men. This advance was only announced authoritatively on Jan. 7, though the increase was provided for on Dec. 16, 1916, and the premium has already been figured in on the last two pays. The raise is somewhat over 10 per cent. on the minimum parts of the wage scale.

It is interesting to note what the basal rates in central Pennsylvania will figure after the bonus is added. The pick-mining rate will be 82.5c. per gross ton, or 73.656c. per net ton. The rate for machine loading will be 48.873c. per gross ton, or 43.637c. per net ton. But it must be remembered that the bonus is not computed on any one item, but on the aggregate pay as computed by the wage scale. It will be instructive to observe whether the compensation in case of injury will be based on the wage scale or on the wage scale plus the bonus.

Review of Last Year's Conditions in Field

There has been some unrest in this central Pennsylvania region. The referendum on the Interstate Conference agreement—on which the central Pennsylvania contract was finally closely modeled, was only voted on by about 9.2 per cent. of the voters in the district. Of these 72.9 per cent. voted for the contract submitted. Clearly the agreement was not popular. When the district contract came up for ratification, 60.3 per cent. of the voters approved it. This shows that there was a strong feeling against ratification. But it was signed and approved by a majority, no matter how small, and it had to be lived up to. At the time it was a reasonably fair agreement, but it soon was subjected to the test of changed conditions. The cost of living constantly mounted, the miners in eastern Clearfield went on strike; competing nonunion operators without jobbing or railroad contracts requiring them to sell coal practically at a cost based on the scale rate raised wages to an abnormally high level in the hope of attracting men; the miners in Jefferson and Indiana Counties denied that they were bound by the contract as they personally had never approved it; finally one concern, the Moshannon Coal Co., raised the pick-mining rate to $1, an increase of 33⅓ per cent. That concern was sued in the courts by the association, which denied its right to make a private contract.

The association has taken a moderate course. It has recognized that wages must slide with the cost of living when living costs rise unduly. It is interesting to note what will happen with the other agreements made with the union at about the same time that this contract was made in central Pennsylvania. The men have sought a readjustment. The union leaders have opposed the making of any demand, but everybody hopes that some way will be found—as in central Pennsylvania—to help the miner who has been hard hit by increased living costs and irregular working opportunities.

The mine worker knows that prices of uncontracted coal are unduly high, though not so high as they have been, and that the old contracts are reaching or have reached their time limit. His leaders know and feel that a bond is a bond, and they are pledged to keep what they have set their hand to, but they nevertheless hope that there is a way without dishonor whereby the exigencies of the hour may be happily met.

Miners Rebel Against Car Pushing

On Jan. 3, between 800 and 1000 miners employed by the Pennsylvania Coal and Coke Corporation, near Patton, Cambria County, Pennsylvania, went on strike claiming that the coal company had not fulfilled its part of the agreement under the present wage scale. Apparently it was understood at that time that the companies in some ways would attempt to satisfy the employees who were complaining about the burden of car pushing. The conference at the time of signing the agreement addressed a letter to all the operators, urging them to give their attention to the car-pushing question to the end that this problem may not be an issue when the time comes to make a new contract.

The contract itself bore no evidence of any agreement requiring the operator to put cars at the working face, but rather the reverse. Rule 21 states:

In cases where miners push cars to and from the face, the empty and loaded cars shall be placed on the heading at the mouth of the room; provided, however, that where mule hauling is used the loaded car shall be taken from the mouth of the room if placed at a parting accessible to the driver.

The Pennsylvania Coal and Coke Corporation is a large company in Cambria, Blair, Indiana and Clearfield Counties, employing about 3500 men.

At a mass meeting of the mine workers held in the evening of Jan. 3, it was decided that the men return to work the next morning pending an investigation and a report on conditions, which latter will be made at a regular meeting of the local union.

Over 300 employees of the Shoemaker Coal Co. at Portage, Cambria County, Pennsylvania, declared a strike on the same day. The men who have to take down roof to make height in the room demand a yardage price for this work. The men held a mass meeting at which the decision to strike was reached, but on a 10 per cent. increase being granted by the company all parties ceased to insist on compliance with their contentions.

Ohio Miners Want Share of Prosperity

On Jan. 12 the Ohio miners, in a convention held at Columbus, Ohio, passed a resolution asking their state officers to confer with the international officers of the United Mine Workers of America relative to the calling of a meeting of the operators of the central competitive district, including Ohio, Illinois, Indiana and western Pennsylvania. This meeting is sought for the purpose of securing for the mine workers involved "a greater share of the present prosperity which we hear so much about but which we do not enjoy."

The state officers are asked to take the matter up directly with the operators of Ohio if the international officers are not disposed to call an interstate conference with the operators of the central competitive district. The miners want the state officers to call that conference with the operators "toward the end that they might agree to grant a voluntary increase of wages at this time."

The miners do not make a demand, as they have a contract running till Mar. 31, 1918. They realize that the shortage of cars has made the run slow, while the higher cost of living has reduced the purchasing power of their wages. Concurrently the price of coal has increased immensely and the operators are prosperous. The mine workers want some of this prosperity for themselves. The mine workers' leaders, who have always contended that wage increases could not await prosperous times, now are disposed to admit that prosperity is not sufficient justification for an increase in wage.

Editorials

What Has Workman's Compensation Insurance Done for Pennsylvania?

A great deal of academic statement has been made about the probable reduction of accidents in Pennsylvania due to workmen's compensation and the insurance provisions arising out of it. Those factors have had a year of trial and what have they done?

In the bituminous mines there were 438 fatal accidents in 1915 and 418 in 1916, a decrease of 20 fatalities, or 4.56 per cent. The number is greater in 1916 than in 1914, when there were only 402 fatal accidents. However, that was a year of relatively low tonnage.

In 1916, according to the figures of Frank Hall, the deputy chief of the Department of Mines of Pennsylvania, the number of employees in the bituminous mines decreased from 183,192 to 171,477, or 11,715—that is, 6.39 per cent. According to the same authority, who only figures on coal from mines large enough for inspection, the production increased from 155,530,511 tons to 166,843,226 tons, or 11,312,715 tons—that is, 7.28 per cent.

Thus the accidents have increased per thousand men employed from 2.39 in 1915 to 2.44 in 1916, or 1.96 per cent., and decreased per million tons from 2.816 in 1915 to 2.505 in 1916.

The rush of 1916 may have had something to do with the result. The hurrying call of the mule driver or the expected arrival of the motor in the heading is often the indirect cause of carelessness in failing to set a prop or to take down a piece of draw-rock; the "quick turn" also makes the miner hurry back to his place before the smoke has cleared out. But despite the hurry and the steady operation, well witnessed by the 7.27 per cent. increase in tonnage, the death rate per million tons fell off, but not so much apparently as was anticipated by the insurance experts.

Speaking before the Conference on Social Insurance, Washington, D. C., as late as Dec. 6, 1916, Herbert M. Wilson, the director of the Department of Inspection and Safety of the Associated Companies, said:

> The average safety condition of bituminous coal mines in Pennsylvania, on Jan. 1, 1916, was 75 per cent. perfect on the standard scale of measurement adopted. The average safety condition of the same mines on July 1, 1916, only six months later, was 92 per cent. perfect. This condition corresponds with an improvement of from 25 per cent. below standard to 8 per cent. below standard, and represents a condition of safety which should correspond with a reduction of fatalities from a little over 3.0 per thousand to one-third this number, or something over 1.0 per thousand. It is rash to predict that the statistics of accidents in the mines affected will be reflected in the statistics this year or next. It is, however, reasonable to believe that such a result will be effected within the next three or four years, provided as good relative progress in the improvement of the condition of the mines is made during the next few years as was made during the past few months.

If the insurance companies are figuring on reductions such as foreshadowed in Mr. Wilson's remarks, and based their rating on them, it is hard to see how they will prosper on such optimism and delayed performance. In 1916 we fell further than ever in the bituminous mines of Pennsylvania from 1.0 per thousand men employed even though we have reduced the rate per million tons 11.04 per cent., which is the more important consideration to the insurance company.

May we not assume that Mr. Wilson's words assure us of further provisions of safety demanded year by year? We are far, it would seem, from his vision of safe mining conditions. The stalk of the Pennsylvania accident plant must be dwarfed from thirty inches till it is like the English plant only one foot high. What if the plants are of a different species and the dwarfing impossible? To drop the metaphor, we have never been overimpressed with the idea that all the greater accident list is chargeable to our laws and methods. Something is due to our roof conditions and other inherent mining difficulties. Some parts of Pennsylvania and Kentucky almost duplicate British results and others have a most unenviable reputation for accidents, proving that the measure mined and its condition has much to do with safety. Figuring on a decrease of 11.04 per cent. per year, that secured in the last twelve months, it will take six years of arithmetical reduction to reach the record set for us by our American insurance experts—a reduction namely of 66 per cent. in our fatal accidents. To attain that end will it be necessary to expend every year as much in refurbishing the plants as in 1916? As a matter of fact is it not unlikely that we shall ever reach that 66 per cent. goal that the critics have set for us?

Mr. Wilson states that "744 mines, inspected and schedule-rated in Pennsylvania and for which reinspection results are available for purpose of comparison, show an average premium rate on first inspection of $3.78 per $100 of pay roll and average premium rate on reinspection of $2.82." This is a reduction of 25.7 per cent. on about half the mines in the state—an improvement both in rating and presumed safety not existent, of course, throughout the whole year, for otherwise rerating would not have been necessary. Moreover we should not do well to assume that any such large improvement took place in the mines not so rated. Consequently, perhaps it is not permissible to expect the fatality rate of all mines to be reduced by the same amount as the premium rate of those 774 reinspected mines, but the difference between 11.04 per cent. for the one and 25.7 for the other is considerable and might be held to show that the expectations on which the insurance companies actually banked their money was not attained in this first year of operation.

Only the bituminous mines have been considered, as they show the effect of both workmen's compensation and schedule rating. In the anthracite region there is too much self-insurance to exhibit clearly the effect of the rating system. It must be remembered that the figures given for tonnage and men employed may well be modified when complete returns of production and working forces appear.

Another Investigation of Retailers

The investigation of the retail coal dealer in Philadelphia seems to have become a fixed habit, and still another inquiry is now being made into the manner of fixing their prices. Despite the fact that it has already been shown on a number of occasions that the margin of retail profit in that city is less than in any other part of the country, the dealers are again to be put on the rack and, if the report be true, indicted by a special grand jury to be called by the Assistant United States District Attorney.

It appears that on Dec. 20 the large retailers decided that conditions merited an increase of 25c. a ton in the retail prices of anthracite. As was natural, many others followed this lead. A strange feature of the situation is that about 20 per cent. of the dealers did not increase their prices until the newspapers began to comment on the subject; in fact, there were a number of retailers who actually did not know that a change had been made. A few of the others only increased their prices 10c. a ton. Since the agitation has begun, however, it has been reported that several of the dealers who instituted the 25c. advance are seriously contemplating a further increase of 25c., claiming that with the shortage of coal and the constantly mounting costs of everything entering into the delivery of a ton of coal they are fully justified in their decision.

In addition to this action of the United States Government it is stated that the city authorities and the state Anthracite Tax Commission are also going to take a hand.

It certainly seems strange that of all the purveyors of the necessities of life the coal dealer must needs be singled out as a special victim. There is scarcely any business in which the profits are so easily ascertainable as in the retail coal business. The wholesale prices at the mines, together with the rates of freight, are public property, so that every individual who buys a ton of coal may easily determine just what profit he is paying.

The average man pays the increased prices for a new suit or a pair of shoes without question, but not so with the coal man. The public does not consider that the coal-cart driver who used to get $10 a week now sneers at $16 and $18, or that the price of feed has doubled, not to mention greatly increased costs for horses, wagons and automobiles.

Not a Discussion of "The Efficient Mine Foreman"

So much is being said about the efficient mine foreman and the efficient fireboss that we come to think their efficiency is the one great need of the industry. Such interest in the staff and such indifference to the line is somewhat undemocratic. It smacks of more aristocratic times, when no one thought of wasting training on the mass of the people.

What we need now, and what we have always needed more than anything, is a trained mine force—everyone skilled and everyone proud of the work he is doing. Anything less will fail to be efficient. It is interesting to see how some of the larger concerns set sights and hire skilled men to see they are followed, and what do they get? Crooked headings, curved tracks, electric wiring with sharp angles in it and roads that do not in any way compare favorably with those driven forty and fifty years ago without sights and with little supervision. The headings of these old-time companies were as straight as a die and the ribs of their roadways have been well declared to be "sand-papered."

It is true there was no need for such a finical smoothing of the ribs with the pick. The workman of that day wasted too much time on mere appearance, but there was a real advantage in the straightness of the road. It saved wrecks on the wooden-tongue tracks. It made it possible to drive a narrower and therefore a safer heading and one on which less had to be expended on timbering. Yet the roadway was wide enough because it was straight. With our cars wandering from right to left of the heading we need more room at the side of the road. With our irregular ribs we need more airway and we are obliged to put little twists in the trolley wire at every supporting and restraining ear.

No surveyors, no bosses can correct these faults. There is no boss so near and so insistent as the eye, the ear, the hand and the brain of the skilled workman. Only as he directs himself can good work be done. But we go on trying to devise impossible mine foremen, everywhere present, all-knowing, perfectly earnest in their work and always on the alert. The workman we are in danger of forgetting. Because the foreman has shown himself desirous of expertness, we try to thrust an efficiency on him that flesh and blood can by no means attain.

Union Opposes the Bonus System

From the headquarters of the United Mine Workers of America has come a mild protest against the bonus system. From what it states it seems to regard the concession in central Pennsylvania as having been granted because of the business activity and profits of the operators. The cause given by the operators, however, is different. They declare the bonus a recognition of the higher cost of living.

As after kiting cost rarely goes back to its previous low level, it is hardly likely that the next scale will be made as low as the present. It may be higher than both the present scale and the bonus together. No one knows. One cannot be surprised at the determination of the miners not to accept next time a wage scale lower than the one which has ruled since Apr. 1 of last year. But it is not likely that they will be asked to do so. The declaration of the union is as follows:

> **Official recognition of the principle of adjusting wages by the application of the bonus system in times of trade prosperity might eventually, by the same process, mean the recognition of wage reductions in times of trade depression.**
>
> **We, therefore, regard with disfavor any effort that would tend to jeopardize the stability and permanence of our present joint wage contract system, by seeking to substitute in its place a wage system based upon the fluctuations of the coal market.**

Surely the union will do well to accept all the bonuses which the operators will grant and not look at the offering askance because it is a gift and not a concession. An ungracious attitude can only do the union more harm than good. The occasion is one calling for the appreciation of the mine workers. If it is not shown, it is unlikely that the operators will ever again be willing to modify their contracts to meet the needs of the miners.

Chronology of Mining Events for 1916

Jan. 1—The new workmen's compensation law goes into effect in Pennsylvania.

Jan. 3—Seth Low, of New York, and Patrick Gilday, of Morrisdale mines, Penn., commence an inspection of labor conditions in Colorado mines.

Jan. 10—Central Pennsylvania operators meet at Clearfield and decide against attending any interstate conference.

Jan. 16—A. C. La Monte, general manager, coal-mining department, Delaware, Lackawanna & Western R.R. dies aged 46.

Jan. 17—A meeting of operators and mine workers' officials from western Pennsylvania, Ohio, Indiana and Illinois decide on an interstate conference.

Jan. 18—Biennial Convention of United Mine Workers meets at Indianapolis, ending Feb. 1.—Consolidation Coal Co. grants miners an increase of 2½c. per ton from Jan. 15.

Jan. 20—John Fulton, expert coke manufacturer and author, dies aged 90.

Feb. 1—The Connellsville operators grant, as on this day, an increase of wages of about 10 per cent.

Feb. 3—Anthracite operators meet and decide not to grant increases unless it seems clear that public are willing to pay more for fuel.

Feb. 4—Anthracite operators start an extensive advertising campaign.

Feb. 8—Meeting of Interstate Conference at Mobile, Ala.; ends without result, Feb. 17.—Explosion at the Nottingham mine of the Lehigh & Wilkes-Barre Coal Co. at Plymouth, Penn., kills 7 persons.

Feb. 11—Explosion at No. 2 mine of the Jefferson & Clearfield Coal and Iron Co. at Ernest, Penn., kills 27 persons.—Bryce R. Blair, pioneer railroad and coal engineer dies at Carbondale, aged 84.

Feb. 21—Conference between mine workers and anthracite operators held in New York, at which operators agree to arrange for committee to discuss the scale.—W. W. Inglis is appointed general manager, Delaware, Lackawanna & Western R.R., coal department.

Feb. 24—Interstate joint conference meets again, this time in New York.

Feb. 28—Safety-First Exhibit of Department of Interior opens and lasts a week. One day is devoted to standardization of mining reports.

Feb. 29—Biennial convention of central Pennsylvania mine workers; ends Mar. 10.—Explosion at Mine 42 of the Davis Coal and Coke Co., Kempton, W. Va., whereby 16 men are killed.

Mar. 8—Wage scale reported by scale committee of miners in central Pennsylvania (signed as of Mar. 6); conference adjourned Mar. 10.—Interstate Joint Conference accepts a wage scale and signs it Mar. 9.

Mar. 9—Mine explosion at Hollenback Colliery, of the Lehigh & Wilkes-Barre Coal Co. at Wilkes-Barre, Penn., whereby 6 persons are killed.—Col. Alfred Hicks, coal operator, dies aged 79.—Anthracite wage conference after seven adjournments finally meets to consider contract.

Mar. 11—Henry Gassaway Davis, United States Senator and coal operator of West Virginia, dies aged 93.

Mar. 16—Policy Board at Pittsburgh, Penn., ratifies Interstate Agreement.—Lehigh Coal and Navigation Co. found guilty of receiving rebates from Central Railroad of New Jersey and fined $540,000.

Mar. 20—Mine workers and operators of central Pennsylvania meet at Philadelphia to discuss demands of former; discussions continue till Apr. 14.

Mar. 21—"Bituminous" coal mine workers in western Indiana meet in convention at Evansville, Ind., and individuals attack new contract vigorously.

Mar. 23—Kentucky Workmen's Compensation Bill signed by Governor.—"Block" coal mine workers meet at Brazil, Ind.

Mar. 28—Mine explosion at the King Coal Co.'s mine at Kimball, W. Va., whereby 6 persons are killed.

Mar. 29—Anthracite Coal Operators Association of independent anthracite operators formed in New York City with aggregate tonnage of 13,000,000 tons annually.

Mar. 30—Mine explosion at the Robindale mine of the Conemaugh Smokeless Coal Co., at Seward, Penn., whereby 8 persons are killed.

Apr. 14—Contract concluded between mine workers and operators of Central Pennsylvania at Philadelphia and signed the next day.—West Virginia Mine Workers' Organization terminates its existence.

Apr. 25—Much-debated Hocking Valley wage scale settled.

Apr. 30—Subcommittee of anthracite mine workers' officials and operators declare that an agreement is reached.

May 4—The anthracite tri-district contract ratified by mine workers in convention at Pottsville, Penn.

May 6—Anthracite biennial wage contract signed to date Apr. 1, 1916, and last four years.—Wage increased throughout Connellsville field.

May 8—Connellsville coal operators raise wages of all their employees.—Illinois wage contract signed by mine workers' officials and operators.

May 12—New specifications for coal adopted by Board of Estimate and Apportionment, New York City.—Western Kentucky conference ends.

May 15—Southwestern Interstate conference meets and immediately adjourns.

May 16—Austin King, chief mine inspector of H. C. Frick Coke Co., dies at Connellsville aged 65.—Miners of union mines in western Kentucky go on strike and operators declare a lockout.

May 23—Trial of President Alexander Howat's suit opens.

June 15—Philadelphia & Reading Coal and Iron Co. concedes that 8-hr. day shall apply to miners only when normal conditions of work and ventilation exist.

June 22—Federal Trade Commission requested by Senate to inquire into operations and accounts of the leading companies producing anthracite.

July 8—Joint board of mine operators and miners meets at Belleville and plans for the maintenance of coal prices at a living level in Inspection Districts 5 and 9 of Illinois.

July 12—In District No. 5, President Van Bitner and Vice-President Hanaway resign their positions.

July 14—Oklahoma operators in Southwestern Conference concede mine workers the same increases as granted in Interstate Conference territory but do not at this time concede the working conditions demanded.

Aug. 8—Mine explosion at Woodward mine of Delaware, Lackawanna & Western R.R., Coal Department, at Wilkes-Barre, Penn., whereby 6 persons are killed.

Aug. 9—In western Kentucky field mine workers' officials tentatively accept offer of operators.—Cabin Creek flood destroys lives of many miners and much coal property in central West Virginia.

Aug. 15—Wyoming wage agreement is signed.

Aug. 18—Rainey resolution directed by House of Representatives to inquire into conditions in the production and distribution of bituminous coal.

Sept. 4—J. P. White declares for the 7-hr. day.

Sept. 7—Oklahoma operators leave the Southwestern Coal Operators Association and the Southwestern Conference.

Sept. 16—Severe fire in mine No. 43 of the Consolidation Coal Co. near extreme end of workings. No one killed.

Sept. 21—I. G. Roby, once secretary-treasurer of Coal Mining Institute of America and mine inspector from 1900 to his death, dies aged 59.

Sept. 29—Referendum ordered in regard to wage scale of Washington miners, which referendum ratified the scale.

Oct. 1—Order goes into force in anthracite region for sealing off of nonworking gaseous sections of the mines.

Oct. 19—Mine explosion at Jamison No. 7 mine, of the Jamison Coal and Coke Co., Barrackville, W. Va., whereby 10 persons are killed.

Oct. 20—L. M. Jones, mining engineer of Bureau of Mines staff, loses his life when engaged in rescue work at Jamison No. 7 mine, Barrackville, W. Va.

Oct. 22—Mine explosion at the mine of the Roden Coal Co., at Marvel, Ala., whereby 18 persons are killed.—Severe mine explosion at Eleanora mine of Rochester & Pittsburgh Coal and Iron Co. takes place when no one was in the mine.

Oct. 23—David Ross, former mine inspector of the state of Illinois, dies aged 55.—Gangway fire in the colliery of the Lytle Coal Co., near Minersville, Penn.; no one injured.

Oct. 24—Explosion in the same colliery, 5 men seriously injured and 3 slightly burned.

Nov. 4—Explosion at the Bessie mine of the Sloss-Sheffield Steel and Iron Co., near Birmingham, Ala., in which 30 men lost their lives.

Nov. 8—Interstate Commerce Commission commences its formal investigation of car shortage.

Nov. 11—Neil Robinson, coal operator and coal expert, dies aged 63.

Nov. 13—David McKeen, lieutenant-governor of Nova Scotia, pioneer in the coal and steel industries of the province and a founder of the Dominion Iron and Steel Co., dies aged 78.

Nov. 14—Uniform Laws Association, formed at a meeting of American Mining Congress, is refused recognition by that body.

Nov. 16—At an explosion of the experimental mine of the Bureau of Mines at Bruceton, Penn., it was proved that Clearfield dust properly comminuted and distributed could be caused to explode.

Nov. 17—Charles J. Roney, former Pennsylvania representative and sponsor for Roney anthracite tax, dies.

Dec. 6—Van H. Manning, director of Bureau of Mines, with the approval of the Secretary of the Interior declares in favor of coöperation at the meeting of the Coal Mining Institute of America.

Dec. 7—Operators in Illinois issue circular against the paying of bonuses.

Dec. 12—Election of international and district officials of United Mine Workers of America.

Dec. 16—Connellsville coal operators raise wages of all employees.—Berwind-White Coal Mining Co. grants 10 per cent. increase in wages.

Dec. 19—Jenkin Jones, vice-president of the Pocahontas Consolidated Collieries Co. and one of the pioneer Pocahontas operators, dies aged 77.

Dec. 26—P. H. Carroll, vice-president and general manager of the Taylor Coal Co., dies aged 52.

BRICK AND CONCRETE FANHOUSE, TENNESSEE COAL, IRON AND RAILROAD CO.'S BAYVIEW MINE, ALABAMA

Discussion by Readers

Tabulating Household Expenses

Letter No. 1—I have often wondered why there was not a small corner in *Coal Age* devoted to the needs of the household and was greatly pleased when I read the article entitled "The Superintendent's Wife," in the issue of Nov. 4, p. 769. I hope such timely articles will continue to find a place in the paper.

My attention was particularly drawn to the statement at the close of this article which read, "Keep your household expenses tabulated." For the last two or three years, as the wife of a busy mining man, I have been wrestling with the household budget, which I would like to submit, in its latest form, for comparison and criticism by those who have attempted something similar.

I started by ruling a double page in an account book so that it would contain a number of columns, each devoted to a particular class of items. This was done each month, at the end of which time the several columns were totaled and the balance or deficiency noted at the head of the column. By this means I was able to tell at a glance whether it was possible to expand or retrench in the family expenditures.

For the purpose of comparison, I have reduced the averages of these columns to percentages of the total available income. The result is as follows:

	Per Cent.
House (rent, heat, light and telephone)	14
Food (meat, groceries, milk, butter, eggs and ice)	26
Clothing (self and family)	16
Household supplies (repairs and renewals, furniture, etc.)	3
Reading and education (periodicals, study courses)	6
Help (kitchen, laundry, yard or garden)	7
Entertainment (theater, dinners, luncheon, recreation, etc.)	3
Vacation (trips out of town, excursions, etc.)	4
Incidentals (numerous items)	14
Reserve fund (interest account in bank)	7
Total	100

By way of explanation, allow me to say that the item for reading and education is here larger than usual, owing to two subscriptions—one to a business-administration course and another to a course in child study. The item "incidentals" embraces expenditures for church, doctor, charity and a hundred and one odds and ends too numerous to mention. The coming year we expect to increase the allowance for our reserve fund, by diminishing the amount expended on educational courses.

"Quite a bit of work," I hear some one say. Yes, but also a lot of fun, not to say a little surprise, at times. Not long ago I saw a book advertised under the title "Household Saving," and sent for it with high expectations. The book arrived in due time and was read with keen disappointment, as sofa cushions stuffed with coffee grounds do not appeal to me, and I do not approve of a kitchen littered up with tin cans rescued from the garbage.

In closing, let me say that I do believe there is a science in housekeeping, the very foundations of which are laid in knowing how and where the money goes. The family budget is a good thing; and where this is a habit such a condition as that described by a woman who I recently heard remark that "the women of coal towns are a shiftless lot," would never be known.

Another may not approve of my form of budget. I do not urge it upon anyone, but I do recommend the keeping of a household budget in a form adapted to one's needs and circumstances. It will prove instructive, profitable and as fascinating as a game. LUX.

Oakmont, Penn.

Textbooks in Examination

Letter No. 9—I am glad to see the question regarding the use of textbooks by candidates in examination again discussed in *Coal Age*, for it is a matter that is not easily decided. I remember hearing a high authority on mining remark that anyone who could memorize all the formulas required in mining was either "a genius or a crank."

In my opinion, any candidate for a mine foreman's certificate should be able to handle formulas and work such technical problems as are common in daily mining practice, but I do not believe it would make him a more competent foreman if he was able to memorize such formulas and constants. A candidate in examination should, I think, be graded on his ability to find and correctly apply the formula or constant required for the solution of a technical question. I do not think that he should be graded on his ability to commit these data to memory.

When a technical question is asked in examination, it is my opinion that the candidate should have access to a memorandum or reference book containing these formulas and constants. Then, it would be up to him to find what he needs and apply it correctly to the solution of the problem.

While I do not believe that it would be wise to permit the unrestricted use of textbooks by candidates during an examination, I am just as certain that it is not a good policy to prohibit the use of these aids by candidates, in the same manner as they use them in daily practice, provided however, that no candidate be allowed to bring any kind of textbook to the examination that he may desire.

For example, were candidates permitted to use any textbook they chose, they would refer, in many instances, to a book of "Questions and Answers," in which they would look for a question similar to the one asked by the board. This would enable them to copy the answer slightly modified so as to suit the case in hand. Unquestionably, such a practice would be wrong, as it would be no test of the candidate's ability to work the problem successfully.

It cannot be denied that problems constantly arise in mining practice that require rules or formulas for their solution and, in my estimation, a mine foreman's efficiency is marked by his ability to find and apply the rule or formula needed, but he should not be required to carry these in his head.

In closing, let me say that I agree fully with Mine Inspector Cunningham's suggestion, *Coal Age*, Dec. 23,

p. 1058, that a small pocket textbook or memorandum should be prepared containing the constants and formulas required to answer such technical questions as are asked in examination. It is certain that no candidate should be allowed to refer to a textbook to answer a practical question in mining. U. S. WILSON.

Briceville, Tenn.

Working the Pittsburgh Coal Seam

Letter No. 1—I was more than usually interested in the article of Thomas Brennan, entitled "Good Results Secured in the Pittsburgh Seam," *Coal Age*, Dec. 23, p. 1038.

Mr. Brennan certainly views the situation from different angles, but not having seen his method of working, in practice, I will not attempt to question the higher percentage of coal recovery claimed, but will say simply that I fail to see how the system described will furnish any great immunity from accidents, more than what will be obtained in most retreating systems. Neither do I understand how the cost of production will be decreased, which is urged as a vital factor of this proposed system.

Certainly, Mr. Brennan must know that the room-and-pillar method, in all its various modifications, has been tried, time and again, in the Pittsburgh district. The cover of the Pittsburgh seam will not average much less than 300 ft. There are numerous instances in the Brownsville (Penn.) region, the Wheeling division of the Baltimore & Ohio R.R., not more than 10 mi. from Pittsburgh, and the Burgettstown (Penn.) section, 25 mi. southwest of Pittsburgh, where the cover runs from 300 to 650 ft. at the shafts, and often reaches a thickness of 1000 ft. back under the hills. I believe that the "Hilltop mines" are being rapidly worked out.

The squeezes and creeps, due to extraordinary conditions of roof and floor and, in some instances, to bad practices, such as providing insufficient pillar supports, driving too wide openings, or lack of judgment in the planning and developing of the mine, have often proved very vexatious. Although it must be admitted that the percentage of recovery has been increased in late years, it is yet true that this is not what it should be and there is still room for improvement.

PRODUCTION OF LUMP COAL IMPORTANT

We all realize that the production of a good proportion of lump coal is the object to be desired; but, under the latest agreement with the United Mine Workers throughout the Pittsburgh district, the run-of-mine system is the prevailing method of mining in use. This system presents no incentive to the miner for producing lump coal and, as a result, the proportion of lump is much less than before the run-of-mine system went into effect.

It was the unfortunate strike in the eastern Ohio district, which lasted about a year, that forced the adoption of the run-of-mine system demanded by the miners, while the companies stood out for the screen-coal basis of payment. Although it is true that a good miner will always try to make coal that is acceptable to the operator, the indifferent miner will persist in shooting his coal to pieces, preferring to let the powder do the work instead of using a little more muscle.

Now, referring again to the system proposed by Mr. Brennan, I have plotted a mine map using the dimensions and following the system described in his article. While the four-entry system mentioned for the main haulage roads and intake and return airways will appeal to mining men whenever the conditions are not prohibitive of its use, it can hardly be considered applicable under the present conditions of working in the Pittsburgh seam.

The agreement with the United Mine Workers, to which I have referred, imposes the payment of yardage in driving places 14 ft. wide, such as the first two rooms on each pair of butt entries mentioned by Mr. Brennan. The agreement also imposes penalties for narrow work. Following is a summary of the cost of mining under this agreement:

	Per Yd.
Cutters, per yard	$0.21
Loaders, per yard	.52
Penalty, per yard, for double shift	.26
Heavy slate (12 in. without pay, over 12 in. to be paid at 7c.)	.53
Wet entries 26c. (figure one-half wet number)	.13
If water drips from the roof and the miner gets wet, the miner gets 5c. per barrel additional	.05
Total	$1.70

Now, figuring a yard of entry 10 ft. wide, 5 ft. 6 in. high, as producing approximately 6 tons of coal, the cost for mining given above imposes an extra burden of 28c. per ton on all entry coal, and this makes no allowance for clay veins, spars, horsebacks, unavoidable falling of roof rock and "sticky bottom," mentioned in the agreement, the allowances for which will increase the cost to 30c. per ton for entry coal, including the 14-ft. places.

OBJECTIONABLE FEATURES OF THE PLAN

It was a matter of much surprise to me that these 14-ft. places, two on each side of the main heading, were found necessary in Mr. Brennan's plan. With the main headings, they make a system of eight parallel entries. It is such features as these that prohibit the adoption of the system proposed by Mr. Brennan, under the conditions existing at present in the Pittsburgh district.

While it is a good plan to drive the butt entries in pairs, on 340-ft. centers, and connect the butts with the main headings by a curve of 85-ft. radius, the plan of driving rooms off one entry of each pair of butts will not be generally accepted by operators in this district. Such a plan would give an excessive yardage. It should be understood that over 90 per cent. of the Pittsburgh-region coal is now mined under the strongest closed-shop agreement.

The figures I have given are based on machine-operated mines. For pick mining, the cost for entry coal would probably reach $2.70 per yd., and each room turned would make an additional cost of $7.15, which makes pick mining, under these conditions, out of the question.

Allow me to say in closing that judging by the plan I have drawn from the dimensions given in the article, it would seem that approximately 50 per cent. of the extraction would be entry coal, and any superintendent or engineer will realize how difficult it would be to convince an operator or manager that it was necessary to drive this amount of entry for the extraction of the coal.

It is interesting to note the absence of any figures showing a comparison of the total extraction expected by the proposed method with the present extraction under the methods now in use.

I have seen many systems tried in the Pittsburgh seam, all of which had some merit, but have yet to see

a system that has no bad features. In our mine, with an average cover of 500 ft. and slate ranging from 18 in. to 4 ft. in thickness, the mine generating gas and operated on a closed-shop basis, under the Pittsburgh agreement, the system proposed by Mr. Brennan is not likely to come into use for many years.

R. Z. VIRGIN,
Supt. Min. Dept., Wheeling Steel and Iron Co.
Wheeling, W. Va.

Letter No. 2—I was greatly interested in reading the article describing a proposed method of working the Pittsburgh coal seam, *Coal Age*, Dec. 23, p. 1038, as the method is similar to the system I am using at the present time. However, I want to say it has some good points and some very bad points, depending on the local conditions in the seam.

When working under a heavy sandrock roof that is hard to break, especially where the coal is underlaid by a soft bottom, I have found it not only a benefit but an absolute necessity to drive all entries to the property line, before starting to draw back pillars in the rooms. Under these conditions, both entries and rooms must be driven on large centers, in order to avoid a creep that would soon close the rooms and destroy the entries.

RETREATING SYSTEM NOT ALWAYS POSSIBLE

On the other hand, where roof and floor conditions are normal, I could not recommend the plan of driving the entries to the property line before turning any rooms, as stated in the article to which I have referred. Under truly normal conditions, there are many objections to such a plan. In the first place, it is a difficult matter to make the men keep their sight ribs clean of refuse when they think they will not have to draw back the pillar themselves. This makes an extra expense for cleaning up the ribs when drawing back pillars.

Again, the plan of driving the entries to the property line before turning the rooms has the disadvantage of delaying the output and making the cost of development a heavy burden. Some companies with good financial standing are able to do this, while other companies require quick returns on their investment, in order to enable them to meet the expense of development. These conditions must always be considered in determining the plan to be followed.

In some cases the plan is adopted of turning the rooms and driving them up to the limit and then leaving them to stand on the pillars until the last room is turned and finished up to the property line. The work of drawing back the pillars is then started at the inby end, both the room and entry pillars being drawn back at the same time.

This plan has the disadvantage of requiring the laying of switches and rails in the rooms twice, once when driving the rooms to the limit and again when it is necessary to draw back the pillars. The same is true of the tracks in the rooms; these must be laid when driving the room up, taken up when the room is finished, only to be laid again when it is necessary to draw back the pillars. If this is not done, a large amount of track and switches must be kept on hand. Such a plan increases the expense of working and is not generally practicable.

The 30-ft. rails mentioned in the article to which I have referred are all right on entries but too long for use in rooms. I would recommend 15-ft. lengths of rail as being more convenient to handle in the rooms and better adapted to the work of drawing back pillars. A 30-ft. rail would either be 15 ft. too long or 15 ft. too short in pillar work.

The suggestion made in the article, namely, to avoid waste by using 10-ft. lengths of rail in laying room switches, is a good one. I have found, in my own experience, that it is a good plan when marking off a place to be turned to measure 10 ft. from the last joint on the entry rail and mark the rib at this distance, for turning the room. By doing this, and by making the room centers conform to the length of rail used on the entry, the waste usual in cutting rails is practically avoided.

Chambersville, Penn. JOHN BUGGY.

Duties of Mine Examiners

Letter No. 1—In the issue of *Coal Age*, Dec. 9, p. 982, Alex Pettigrew asks for the opinions of readers in regard to the duties of mine examiners, under the coal-mining laws of Illinois.

My opinion is that the law must be interpreted exactly as it reads in sec. 21, from which I quote the following paragraph that requires the examiner,

> 6. When working places are discovered in which there are recent falls or dangerous roof or dangerous obstruction, to place a conspicuous mark or sign thereat as notice to all men to keep out. . . .

But Mr. Pettigrew asks whether a working place in which loose rock has been discovered and marked by the fireboss can be considered safe for the miner to enter, or must all men be notified by a conspicuous sign to keep out?

In reply to this question allow me to say that I do not understand it is the intent of this law to forbid the entry of a miner into his place under the conditions mentioned. In making the morning examination of his district, the fireboss will sometimes find many such places. It may be loose rock, or loose coal on the face or rib, timber needed or something similar that must be attended to promptly but does not require a "notice to all men to keep out."

Under these circumstances I believe the fireboss is required by the law to take up the miner's entrance check and turn it over to the mine foreman whose duty it will then be to instruct the miner to attend promptly to the timber, loose rock, or whatever has been reported as needing attention.

UTAH MINER.
Salt Lake City, Utah.

Storage-Battery Locomotives

Letter No. 3—I was interested in reading the letter of G. E. Alloway, *Coal Age*, Dec. 16, p. 1019, and quite agree with him that what is needed to make the locomotive I am operating stand up to its work for a full shift of eight hours is a larger battery.

This locomotive was the first battery machine that we had used in this mine and we have not understood its operation sufficiently to give it the care needed. As a result, the temperature has often risen to a higher point than it should, which has acted to shorten the life of the battery.

At the present time I am using a battery of only 42 cells. For the past 16 months the motor has been running

on this battery and three months of the time the machine was double-shifted. I believe that if we had used a 56-cell battery, instead of one of 42 cells, the motor would have given eight hours' service without any difficulty, on the heavy grades in our mine.

There are, at least, two points of great advantage in locomotive haulage as compared with mule haulage, and these are often overlooked in comparing the two systems. First, when mule haulage is employed in a seam underlaid with a fireclay bottom, especially if the mine makes any water, it will frequently happen that the mule will sink almost knee deep in mud. Even when the bottom is dry and soft the constant travel of the mule will dig deep holes in the track between the ties, which becomes a source of great annoyance both to men and animals when traveling such a road.

The second point often overlooked is the large amount of fine dust on the roads that results from the constant tramping of the mules back and forth. The small coal that falls from the cars is thus ground to a fine dust under the feet of the mules. This does not happen in locomotive haulage. It is not uncommon in mule haulage to see mine roads covered with dust from 1 to 4 in. in depth. It cannot be denied that this is a menace to the safety of a mine, as it invites a coal-dust explosion that would not otherwise occur. JESSE HAMILTON.

Terre Haute, Ind.

The Fireboss and the Miner

Letter No. 1—There are a large number of different kinds and classes of work connected with the operation of a coal mine. I could name some 52 occupations in and around the mines, and this probably does not include them all. Not the least in importance among these is the position of fireboss.

The fireboss is the mine foreman's lieutenant, although his duties are of a particular kind and require a fair education. Because the fireboss holds a certificate of qualification granted him by an examining board, it does not follow absolutely that he is able to perform satisfactorily the many arduous duties that devolve on him by reason of the position he holds. What I mean to say is that the certificate is not all that is required to make a good fireboss.

On the fireboss, more than on any other man, rests the responsibility for the safety of every one underground. He must be able to detect promptly any dangerous condition that is liable to develop in a working place. It is in this respect that the fireboss is confronted with one of his most difficult problems. When a man's place is found to be dangerous, of course, the easiest solution is to send the man home for the day. This may be necessary at times, in order to allow the place to settle, when the danger will be past.

When the roof in a place is "working," the best judgment of the fireboss is required to determine its safety and decide on the proper remedy to employ. Under these conditions, he is confronted with two propositions: (1) The safety of the man, who may be the only support of a large family, and (2) the car of coal necessary to maintain the daily output of the mine. To send a man home would be safe and this may be necessary, but the man will then be deprived of his earnings for that day and the company will lose the coal he would load.

On the other hand, to allow the man to remain in his place causes the fireboss to assume the responsibility for his safety; while to send the man home may perhaps bring an unjust and unreasonable reprimand by the foreman, who is prone to consider the car of coal as of equal or even greater importance than the man's safety.

This relation that the fireboss sustains to the miner is one that requires good judgment and prompt and decided action. A good man will resort to any expedient that will please both the miner and his foreman. He may be able to shift the miner to other work for a short time, while timbermen are sent into the place to make it secure and safe for work; or the miner, if experienced, may assist in the timbering of the place or perform the required work unaided.

The danger discovered in a working place is not always one that can be removed by timbering. The place may have struck a gas feeder and be unsafe for work until a brattice can be erected to deflect the air current and cause it to sweep the face of the coal. The flow of gas may be such as to endanger adjoining places and, before anything can be done, it may be necessary to withdraw the men working in them, especially those on the return side of the place.

The solution of these problems that constantly arise in the mine and must be met by the fireboss call for an accurate knowledge of the character, properties and behavior of mine gases and the best methods of dealing with them. To meet these difficulties, and to satisfy the miner and the mine foreman alike, the fireboss must be a man with the "goods." He must have the "pep" that will establish confidence in his judgment and acts.

Plymouth, Penn. JOSEPH R. THOMAS.

Mine-Accident Record

Letter No. 4—Of all accidents occurring in the mines through carelessness, those that show the greatest recklessness on the part of the miner are where men return to a shot that has failed to explode in the time expected. This is more liable to occur in firing shots with fuse than by any other method of blasting.

A miner will frequently prepare two or more shots and, lighting the fuses at the same time, retire to a safe distance to wait for the shots to go off. Hearing but one report, after waiting what he thinks is a long time, he goes back to see what is the trouble and is often caught by the explosion of the second shot and killed or crippled for life. The records of such accidents would fill a volume, but I will cite one or two instances in the hope that they may serve as a warning against this practice.

In one instance the room had been driven in about three cuts from the entry. In this place two rib shots had been prepared and were to be fired by fuse. Having ignited the two fuses, the miner retired to a safe place and waited. One of the shots went off, but the explosion of the other being delayed, the man went forward to investigate. Just as he reached the place the shot went off, killing him instantly.

At another mine two men were working together—one a miner of 26 years' practical experience and the other 12 years. These men, having lighted their shots, retired to await the explosion. Hearing but one shot go off, the older man accused his partner of not having lighted his fuse, which the other denied.

After waiting a while longer, the more experienced man said he would go and see and wanted his partner to come along and show him a light. They approached the place cautiously, striving to shield themselves behind the rib. The older man went ahead, while the younger kept close to the rib, holding the light in his extended hand.

Just then the shot went off and, although not hit by any flying coal, the older man, who was nearer the face, was blinded by the dust and powder thrown into his eyes. The shot was a good one, there being just sufficient powder to roll the coal over. Otherwise, both of the men would have been killed. The older man lost the sight of both his eyes.

At another time, in the same mine, one of the most practical men in the mine lost the sight of one eye, in the same way, by returning to a shot that had failed to explode. This also was a good shot, the charge being just strong enough to break the coal. To this fact alone the man owes his life.

A similar accident occurred within a short time, in another mine, under the same circumstances as those just related. In this case also the shot was a clean one, just rolling the coal over, but the miner lost the sight of one of his eyes by the dust and powder blown from the hole.

These shots were all fired by fuse, and one cannot but wonder that a miner will risk his life by returning to such a shot when all he has to gain is a few tons of coal. If miners realized this, they would not be willing to take these chances. W. L. MORGAN.

East St. Louis, Ill.

Letter No. 5—Citing an accident that occurred in his mine, a certain writer mentions that a miner was killed while loading coal without resetting the timbers that had been knocked out by shots the night before.

I attribute an accident of this kind to the fault of the management, although there is no question but that the miner is likewise to blame. Under the most approved system, which has long been the practice of the H. C. Frick Coal Co., miners are not permitted to fire their own shots.

Where the coal is cut by machines, and, in many cases, in pick mining, competent shotfirers are employed whose duty it is to examine or charge and fire all shots at night. This practice has the advantage that any danger to which the miner might be exposed by the timbers being knocked out in the firing of the shots is at once discovered by the eagle eye of the fireboss when he makes his morning examination.

In commenting on mine accidents, one writer claims that these will continue to occur until more experienced men are employed. I heartily agree with this statement, if by "more experienced men" is meant competent shotfirers.

When shots are fired at night, and the mine is examined by reliable firebosses before the men enter the mine in the morning, any dangers that may exist at the working face should be detected and removed before the men in such places are permitted to proceed to their work. In every case daymen should be sent promptly to those places to reset the timbers that are knocked out or remove any loose pieces of slate and put the place in safe condition. I believe that where this principle is carried out thoroughly and conscientiously in the operation of a mine, much of the mining law can be laid aside without danger of accidents occurring as the result of a miner's place being unsafe for work and the miner himself careless or reckless.

Oliphant Furnace, Penn. JOHN H. WILEY.

Recovering a Flooded Mine

Letter No. 2—The inquiry of T. S. Almond, *Coal Age*, Dec. 30, p. 1101, calls to mind an experience of mine of a similar nature some years ago. I regret that Mr. Almond has not given more particulars in regard to the kind of material above the roof slate and the thickness of the slate, as much will depend on these two items.

In my own case the mine that was drowned out had been opened in a seam of coal 9 ft. thick and having a grade of 4 in. to the yard. This seam was overlaid with a hard roof slate about 3 ft. thick. Above the slate was about 20 ft. of a black "rashing." When the roof slate broke and fell this rashing would run like quicksand. The floor of the seam was a fireclay that gave much trouble by heaving.

During the time that the water filled the mine workings, the roof and floor did not move; but, as soon as the water was drained from the mine, the floor started to heave, the timber gave way and the roof caved in places. In order to deal with these conditions, it was decided to fall back about 50 yd. outby from the cave. There a place was turned off and driven around the fall. The side next to the fall was cribbed every 6 ft. and a longwall face was started, beginning at the point where the road branched from the old entry.

The longwall working gave better roads, and there was less trouble with the timbering. The water was handled by an electric pump. The cover or overlay of this seam was 500 yd. thick and the distance driven underground was about 1 mile.

DIFFICULT TO ADVISE WITHOUT MORE DETAILS

In regard to the case Mr. Almond has mentioned, it is difficult to suggest the best method to pursue without knowing better the conditions regarding the strata overlying the seam and the drainage afforded. I would recommend, in a general way, sinking a drillhole near the face of the workings, if the seam dips in that direction. This would give a better opportunity for completely draining the mine without extending the pipe line. Later, it would be found of advantage to install an electrical pump in the workings and drain the mine by pumping the water out through the drillhole, which would avoid the annoyance of a steam pump in the mines.

It must be remembered that the action of the air on a water-soaked roof is bad and liable to cause much slate to fall. It is possible that this condition may produce an even greater expense for cleaning up the roads and workings than would be incurred in the opening of a new mine. However, it must be admitted that, in most cases, the time required to unwater a flooded mine will be much less than what would be necessary to open and develop a new mine. I want to suggest that if the situation affords an opportunity to drive an opening that would give natural drainage to this seam, the expense of so doing would probably be more than compensated by the saving in pumping and piping required.

Mystic, Iowa. WILLIAM JAMES.

Inquiries of General Interest

Cleaning Up a Roof Fall

I have just learned of an accident that occurred recently in one of the mines in this district and, from the information that has come to me, I am led to believe that the assistant mine foreman made a grave mistake when he ordered the timberman to clean up the fall without instructing him to first pull down all loose slate and timber the edges of the fall so as to make the place safe for work. I want to ask if the readers of *Coal Age* will state their opinion as to whether the assistant foreman properly performed his whole duty. A MINER.

Oliphant Furnace, Penn.

[This is a proper question, and we hope it will bring a ready response, as it has an important bearing on the avoidance of mine accidents.—Editor.]

Checking-In-and-Out System in Mines

Kindly permit me to ask for suggestions from readers of *Coad Age,* in regard to a suitable and practicable system of checking men going in and passing out of a large mine, where the underground workers are constantly changing from one place to another and from one entry to another. This is a matter that has caused considerable confusion and annoyance, at times, in our mine, and I would appreciate the suggestions of men who have been in charge of large operations and to know the system they have employed and the results obtained.

H. CLYDE ELKINS, Asst. Engr.,
Washington Coal and Coke Co.

Star Junction, Penn.

[Although this matter has been referred to briefly at different times, in *Coal Age,* we shall be glad to give space for its further discussion and hope that some of the methods employed at the larger mines be given in detail.—Editor.]

Circulation in a Safety Lamp

For some time past the question has been discussed, here, by mine officials and students preparing themselves for the state examination, in regard to the manner in which marsh gas or firedamp enters the Wolf safety lamp. There is considerable difference of opinion expressed, and we desire to obtain a consensus of the opinions of *Coal Age* and its readers who are experienced in the use of this safety lamp.

It is claimed by some that the air and gas enter the lamp at the bottom, while others, including myself, maintain that the entry is at the top of the lamp, the gas passing through the bonnet and down into the combustion chamber. This opinion is based on the fact that the gas is lighter than the air and, on this account, it seems only reasonable to suppose that marsh gas would enter the lamp through the upper portion of the gauze or bonnet.

———, Colo. W. F. L.

The Wolf lamp was designed to combine some of the best features of all safety lamps. The general type of construction employed is that of a bonneted Clanny lamp. Unlike the Clanny, however, the Wolf lamp adopts the Eloin principle, which admits the air into the combustion chamber of the lamp, through gauze-protected openings beneath the glass, at a point just below the flame. These openings are arranged in a shallow ring that is made to fit snugly in a recess of the lamp vessel just below the glass and is covered with wire gauze.

The purpose of this construction is to make the circulation within the lamp ascensional, which was not the case in the Clanny lamp, where the air was admitted through the lower portion of the gauze just above the glass and descended to the flame. This naturally resulted in a conflict of the descending and ascending air currents in the combustion chamber and caused the flame to smoke, which detracted from the illuminating power of the lamp.

Another feature peculiar to the Wolf lamp is the corrugated bonnet, which was provided with tangential openings that deflected any sudden rush of air and gas to which the lamp might be exposed and which would be forced momentarily through the openings in the bonnet. This feature prevented the inrush of air through the bonnet impinging directly against the gauze of the lamp.

Regarding the question asked, it would be a mistake to say that the air charged with gas enters the Wolf lamp through the top or upper portion of the bonnet, normally. As has been stated, this lamp is designed on the Elion principle, which provides for the feed air to enter the combustion chamber of the lamp at a point below the flame, so as to insure that the circulation within the lamp shall be wholly ascensional.

As previously suggested, air or gas would only enter through the upper portion of the bonnet, in this lamp, under exceptional conditions where the lamp might be exposed to a sudden rush or blast of air. Under normal working conditions, the openings in the bonnet serve as outlets for the burnt air and gases that rise in the chimney and escape through the top of the lamp.

It is true that methane or marsh gas is lighter than air, but this fact is only important in connection with its accumulation at the roof or in the rise workings of the mine. The feed air, more or less charged with gas, presents a uniform condition in respect to the distribution of the air and gas in the current entering the lamp. It must be remembered, also, that the burnt air and gases flowing from the top of the lamp have a much higher temperature than the feed air charged with gas and entering the bottom of the lamp. The heated condition of the air and gas within the combustion chamber is the chief factor that produces the upward circulation in the lamp and which is described as "ascensional circulation."

Examination Questions

Tennessee Mine Foremen's Examination Held Oct. 9-12, 1916

(Selected Questions)

Ques.—Name a gas commonly found in mines and which is heavier than air; also one that is lighter than air.

Ans.—The most common mine gas that is heavier than air is carbon dioxide (CO_2). The specific gravity of this gas is 1.529. The most common mine gas lighter than air is methane, or marsh gas (CH_4), and its specific gravity is 0.559.

Ques.—What noxious gases are produced by fires and explosions of firedamp in mines?

Ans.—The gases produced by fire or explosion are chiefly carbon dioxide (CO_2), which results when combustion of carbonaceous matter takes place in a plentiful supply of air; carbon monoxide (CO), which is the result of the combustion of carbon in a limited supply of air. An excess of nitrogen is caused by the depletion of the oxygen in the air, which is consumed by the combustion of the carbonaceous matter and inflammable gases that feed the fire.

Ques.—What effect has undiluted, or pure carbureted hydrogen, on life and on fires in mines?

Ans.—Undiluted or pure carbureted hydrogen, or marsh gas (methane), contains no available oxygen and will therefore support neither life nor combustion. Its effect when breathed into the lungs is to suffocate by excluding the oxygen necessary to support life. Because this gas contains no available oxygen, it will not support flame, which would immediately be extinguished in such an atmosphere.

It is important to notice, however, that pure marsh gas undiluted with air seldom exists in the mines, owing to the rapid diffusion of this gas into the air and, in such cases, the mixture contains a high percentage of gas and a correspondingly low percentage of air. Such a mixture is very dangerous in the mine, because of its liability to become highly explosive by the addition of more air.

Ques.—How many cubic feet of carbon dioxide in a volume of 50,000 cu.ft. of air will make it injurious to health or fatal to human life?

Ans.—Assuming that this volume of air (50,000 cu.ft.) is in normal condition; that is to say, the ratio of oxygen to nitrogen is 20.9:79.1, the addition of carbon dioxide would produce a fatal atmosphere when the mixture contains 18 per cent. of this gas and 82 per cent. of pure air. The total volume of the mixture, in this case, would then be $50,000 \div 0.82 = 60,975$ cu.ft. Therefore, the volume of carbon dioxide required to produce such an atmosphere would be $60,975 - 50,000 = 10,975$, or practically 11,000 cu.ft.

A much lower percentage of carbon dioxide added to pure air would produce an atmosphere injurious to health, the effect depending very largely, however, on the physical condition of the individual. An atmosphere containing 5 or 6 per cent. of carbon dioxide will generally produce panting and exhaustion in a brief time.

Ques.—What produces whitedamp and blackdamp in mines?

Ans.—What is termed "whitedamp" by miners is air containing a high percentage of carbon monoxide. Such an atmosphere is produced by any combustion of carbonaceous material taking place in a limited supply of air. It is largely produced by gob fires occurring in waste or abandoned places in mines or mine fires of any kind where the air supply is limited; also by the explosion of gas and dust, or powder in blasting.

The term "blackdamp" is a mixture of noxious and irrespirable gases in the mine air. These gases consist chiefly of carbon dioxide and nitrogen. Blackdamp results from any form of combustion in a plentiful supply of air, whereby carbon dioxide is produced and the oxygen of the air consumed, leaving an excess of nitrogen.

Ques.—How are mine gases detected?

Ans.—The presence of methane or marsh gas and carbon dioxide is detected by observing their effects on flame. Methane mixed with a sufficient proportion of air lengthens the flame of the safety lamp, increases its volume and, in larger proportion, agitates the flame, the mixture becoming explosive as the proportion of gas is increased. A still larger proportion of gas mixed with the air produces an extinctive effect on the flame of a safety lamp, which is extinguished when the percentage of gas is sufficiently high.

Carbon dioxide when mixed with air in small proportion dims the flame of the lamp, which is extinguished in a larger proportion of the gas. The presence of this gas is also detected by its effect on the human system, producing headache and nausea, and finally suffocation.

The presence of carbon monoxide is best detected by observing its effect on small animals, as mice and birds, which are prostrated in about $^1/_{20}$ of the time required for the gas to produce a similar effect on the human system.

Hydrogen sulphide in small percentage is detected by its smell, which resembles that of rotten eggs.

Ques.—Why is it that marsh gas is generally found lodged near the roof and carbon dioxide near the floor?

Ans.—Methane or marsh gas is lighter than air of the same temperature and pressure, its specific gravity being 0.559 referred to air as unity. The specific gravity of pure firedamp at its most explosive point is practically 0.96, while the specific gravity of a mixture of marsh gas and air formed by diffusion alone is 0.747. All of these mixtures being lighter than air tend to lodge or accumulate at the roof or at the head of a pitch or rise workings in mines.

In like manner carbon dioxide is about one half again as heavy as air of the same temperature and pressure, its specific gravity being 1.529 referred to air as unity. For this reason, carbon dioxide tends to sink to the floor or lodge in the dip workings of mines.

Coal and Coke News

WASHINGTON, D. C.

Complaint has been filed with the Interstate Commerce Commission which is intended to show how the car shortage is operating to the detriment of the coal trade, while at the same time alleging that the railroads have the situation in their hands to turn this shortage to their own benefit. The complaint was brought by the Southern Appalachian Coal Operators Association which is composed of the operators in bituminous coal located in southeastern Kentucky and eastern Tennessee. These operators market their coal, it was stated, in Pennsylvania, Ohio, Indiana, Illinois, Michigan, Minnesota, South Dakota, Wisconsin, Iowa, Nebraska, Kansas, Missouri, Kentucky, Tennessee, Alabama, Georgia, Mississippi, Louisiana, North Carolina, South Carolina, and Florida.

The Louisville & Nashville R.R. was named defendant. The complaint was based particularly upon the rules, regulations and practices of this road as it relates to the purchase of fuel coal and the distribution of its coal cars. New rules and regulations, it was stated, were promulgated on Oct. 7, 1916, which, in effect, gave preference in the distribution of coal cars, to those mines which furnish the road with fuel coal. Notices of the road, promulgated under dates of Nov. 21 and Nov. 29, related to the price, $1 and $1.10 per ton, which the road would pay for fuel coal. In order to obtain a good proportion of coal cars for the commercial distribution of coal these operators, it was claimed, are being forced into selling a certain amount of their coal to the road for fuel at the price stipulated by the road in question.

This complaint was signed by E. C. Mahan, chairman of the transportation committee of the operators association, and its attorneys and assistants, Francis B. James, E. E. Williamson, Wayne P. Ellis, and Clarence B. Hewes.

The same attorneys on behalf of the same association also filed a second complaint in which the car shortage and distribution of coal cars was taken up from a different point of view. In this instance all the connecting railroads were brought into the petition and the complainants alleged that they were unfairly discriminated against by reason of the fact that they are not receiving a just proportion of cars in the distribution of all the coal cars of the Louisville & Nashville and the connecting carriers, that mines on other roads are being favored.

This complaint was based upon the through route and rate agreements between the roads, and the Commission was asked to investigate this matter thoroughly and prescribe reasonable rules and regulations for the interchange and return of cars between the carriers.

In a third complaint filed by the Wasson Coal Co. of Harrisburg, Ill., which operates mines in Saline County of that state, the direct charge was made against the Cleveland, Cincinnati, Chicago & St. Louis R.R. that it does not exercise due diligence in securing the return of its cars. The complaint filed by this company petitioned the Commission to enter a decree compelling the road to exercise due diligence in the return of its own coal cars and to distribute these cars among the mines on its lines in a just proportion.

The complaint stated:

"That defendant railway company is connected in its operation with the New York Central railway system. The defendant owns about 11,200 coal cars. It does not have now and has not had for several months last past more than 3500 of these cars upon its line and including foreign cars upon its line has not had over 7000 coal cars. Complainant insists that the defendant has not been exercising due diligence in securing the return of its cars to its own line, but on account of the connection with the New York Central system, has been allowing that system to discriminate against the defendant company in the return of cars and the defendant company is consenting or acquiescing in such discrimination, to the injury of the complainant.

That the defendant is refusing to sign bills of lading when coal is loaded in cars, but is returning same unsigned and appropriating said cars, without the consent or authority of the complainant and without signing bill of lading.

The defendant has been and is discriminating against the complainant in furnishing to the O'Gara Coal Co. for use at its mine No. 8 all the cars demanded at said mine No. 8, while complainant does not receive more than 30 per cent. of its requirements. This is under a claim that this coal is for fuel for the defendant. This coal, however, is not taken for nor being used upon this division of the defendant's line, but is being diverted to other branches of this system. The defendant has just adopted a plan of furnishing to all other mines in this group except those of the complainant, cars for a day's run each week for fuel for the defendant, in addition to the regular supply of available cars and to the great damage of the complainant. The complainant recognizes the defendant's right to furnish cars for its necessary fuel supply but denies its right to come into a field or group of mines and furnish a supply of cars for a great amount of fuel to be taken entirely off the division, only to some of this group of mines to the damage, in fact, to the destruction of other mines. So under the peculiar conditions existing here we complain of this practice."

The petition also stated that the defendant railroad is furnishing cars to mines located at Norris City, Ill., on the Baltimore & Ohio, to the injury of the complainant.

The petition was signed by C. M. Wasson, president and general manager of the Wasson Coal Co., and W. C. Kane, attorney for that company.

Government to be Forehanded

All coal for government use in Washington will be purchased in the spring or early summer and stored in a large centrally located yard, if an idea originating with Van. H. Manning, director of the Bureau of Mines, takes shape. As an outcome of the coal shortage this winter the Secretary of the Interior designated Mr. Manning to investigate the matter in the hope of evolving a more systematic method of supplying the government's power and heating plants with fuel. During the entire winter practically every government plant has been forced to secure its coal on a day-to-day basis. In some instances it has been necessary to shut down for a limited period until coal could be secured.

An Interesting Investigation

Rapidly increasing cost for timber is causing a general demand on the Bureau of Mines for an investigation of the whole question of mine supports. Steps are being taken looking to the consideration of this question during the next fiscal year. The investigation is expected to result in the collection of much more accurate data concerning the strength of coal left in pillars, the strength of all supporting materials and the strength of concrete and brick arching. As it is not known with any degree of positiveness how rock movements increase the stress thrown upon artificial supports the investigation is expected to go into this feature of the question. The study will necessitate the use of a large strength testing machine in which the various supporting materials may be tested.

The Bureau has in press a discussion of experiments in which blocks of Pittsburg coal, in 4-ft. and smaller cubes, were used. These tests on large sized blocks are expected to make it possible to determine the proper size of the pillar in proportion to the width of an excavation and depth of cover.

Combustion Stimulants are Fakes

Chemical mixtures claimed to aid combustion have just been investigated exhaustively by the Bureau of Mines and the conclusion reached that such mixtures as were tested possess no such merits as are claimed by their manufacturers. As a result of this finding the Post Office Department expects to issue several fraud orders.

Analyses of the materials used disclose that no ingredient has any appreciable effect upon the burning of coal. The tests also indicate that the claim that the mixtures have properties valuable in the saving of fuel is absolutely unfounded.

HARRISBURG, PENN.

The Public Service Commission has directed a public hearing to be held at the Capitol on Jan. 18, on the application of the Pennsylvania Railroad Co. to amend its tariff rates on bituminous and cannel coal so that they shall apply only to cars loaded at tipples.

The company filed the application recently, and asked that it be made effective on less than the usual 30 days' notice. The application for amendment carries this wording: "The rates named in this tariff will apply only on coal loaded directly into cars from regular tipples with track connections with this company and coal cars will only be furnished for the loading of coal directly from such tipples."

According to officials of the commission the company in presenting the application holds that the change is necessitated by reason of the car shortage and that it is being called upon to furnish an increasingly large number of its cars on public sidings for the loading of coal hauled there by wagons. It is also alleged that if the loading from wagons is continued it will further complicate the car shortage.

Is Workmen's Compensation Beneficial?

Has the workmen's compensation law, in its first year of operation accomplished anything in a broad way for the miners of Pennsylvania?

From a superficial examination of the reports made public by the Workmen's Compensation Board it is found that hundreds of thousands of dollars have gone into the hands of injured miners and to the dependents of dead mine workers during 1916. The average compensation to the family of every mine worker killed is estimated to have been $2388. The largest amount paid as the result of a single mine accident was $7,540.56.

Before the workmen's compensation law went into effect, in the last 5 years, fatal mine accidents threw helpless upon the world more than 30,000 widows and orphans. There is to be excepted from this number, a few cases where lawsuits were successfully prosecuted or where the coal companies or some agency took care of the dependents for several years.

During the year 1916, the first year of the law's operation, more than a thousand widows and orphans were kept from poverty as a direct result of compensation under the law.

What the compensation has meant to beneficiaries in individual cases only they themselves know. Its results appear in the form of keeping the homes together, education of children has been continued where otherwise it might have been curtailed. The terrible period immediately following the death of the breadwinner is tided over safely and time and opportunity is afforded for the development of new plans.

The law seems to be generally regarded as a first rate compensation statute, but experience with it has brought about various suggestions of improvement dictated by the interests of those suggesting them.

The mine workers are of the opinion that the 14-day limit should be shortened and also that a widow's compensation should continue throughout the period of her dependency, rather than for a specified number of weeks. Some widows remarry, some die soon after the death of their husbands, but many of them are in a state of dependency for many years.

The Insurance companies propose an interesting question concerning the law, namely, if the State Insurance fund goes broke, or if any of the insurance companies dealing in compensation cases go bankrupt, who is to pay the compensation? This question has never been satisfactorily answered, neither is there any provision in the law for this contingency. Many operators feared this would be a stumbling block for them if they applied to carry their own insurance, thinking this would be the first question the mine workers would ask them "Where would they come in if the company went broke?"

From the point of view of the mine workers there are two things which will bear largely upon the future popularity or unpopularity of the law among the men and these will be governed largely by the action of the compensation board.

One is that of dependency. The compensation board has ruled where a son is killed the fact of dependency must be established beyond a doubt, that in each individual case the matter must be fought out. The men claim there isn't a miner's family in existence where a son is working that the family is not dependent to great extent upon this son's earnings.

The other is that of hernia and this rests largely upon the liberality with which the coal companies handle these cases. Medical authority has it that an old hernia cannot be told from a new one after it is three weeks old. However, some companies contend in some cases that the hernia is an old one. Other companies, whether the hernia is old or new, agree to have the men operated upon and restored to work. This question of hernia is the cause of much dissention between the men and the operators.

The operators as a whole are satisfied with the present compensation law. A few think that the mine worker is more careless since he knows he will be taken care of if injured, while others are of the opinion that there is no difference in the care the men now take of themselves and that before the compensation law went into effect.

PENNSYLVANIA

Anthracite

Hazleton—Because of the scarcity of labor considerable new work, estimated at hundreds of thousands of dollars, will not be attempted in and about the mines of the Lehigh coal field the coming spring and summer. Construction of the

tunnel from the Hazleton basin to the Butler Valley has been indefinitely postponed.

Lansford—A 16-in. bore hole, the largest of its kind ever sunk in Carbon county, is being drilled at Spring tunnel, as an air hole for No. 9 mine of the Lehigh Coal and Navigation Co.

Minersville—One woman coal operator is sharing in the present prosperity of the coal trade. She is Mrs. W. W. Scott of Minersville, owner and operator of the Silverton colliery a small operation which adjoins the workings of the Lytle Coal Co. Mrs. Scott took charge of the colliery after the death of her husband some years ago, and has operated it with the help of James Scott her mine foreman ever since. The colliery formerly sold to local trade but the present demand was so insistent that shipments were commenced by rail. The colliery employs about 30 men and boys and daily shipments are close to 80 tons, which is hauled by wagon some distance to Forestville the nearest shipping point.

Pottsville—An innovation which will be watched with interest by the different coal companies is the scheme of paying the inside men which was tried at the Pine Hill colliery, near Pottsville recently. The men at this colliery as well as at other nearby operations have complained and threatened to strike because of having to stand out in the wintry blasts while waiting for their pay. To avoid this and to give the men the needed protection, Superintendent C. H. Strange, had a paymaster's office built in the mine. Arrangements have been made to give shelter to the outside employees while they are being paid and it is hoped in this way that the problem of shelter will be solved for the winter.

Wilkes-Barre—The shipment of anthracite during December of 1916, as reported by the Anthracite Bureau of Information, amounted to 5,582,747 tons, as compared with 5 992,997 tons for the preceding month, and 6,149,387 tons in December of 1916. The decrease as compared with November was 410,250 tons, and as compared with December, 1915, it was 566,640 tons. The decrease for the year not including coal reclaimed from storage yards, amounted to 507,412 tons.

Bituminous

Pittsburgh—Announcement was recently made of the formation of the Reilly-Peabody Fuel Co., which recently took over the American Steel Co.'s coal and coke business, and its stock in the American Connellsville Coal and Coke Co. The new corporation is capitalized at $200,000, and has opened offices in the Frick Bldg. The president of the new company is Eugene S. Reilly. F. E. Peabody is treasurer, and L. P. Monohan, secretary. The Connellsville plant has a monthly capacity of 23,000 tons of coke, and the mines produce 17,000 tons of coal.

Twelve thousand acres of coal land in Greene County have been optioned by the Bethlehem Steel Co. at $600 an acre, the highest price on record. The holdings embraced in the options include a tract of the Emerald Coal Co., comprising 8733 acres in Morgan, Franklin and Washington townships; the holdings of E. H. Jennings, of Pittsburgh, 2989 acres in Washington township, and smaller tracts owned by Greene County farmers. It is reported that the holdings of J. V. Thompson in several townships are also under option.

Nanty-Glo—The large supply house of the Lincoln Coal Co. was burned to the ground on Jan. 10. Several thousand dollars' worth of mine supplies were destroyed by the blaze. The fire is believed to have originated when a tar mixture being prepared exploded.

A score or more new houses are to be erected in the spring by the Ebensburg Coal Co. The Ebensburg firm has opened a new plant and the house will be badly needed when the operations are working full time, as many miners will be engaged.

Revloc—Three shifts have been put to work by the Monro Coal Co. so that its new plant can be opened by the early part of the spring. Two new shafts are being sunk and a railroad spur located.

The new operations of the Punxsutawney Coal Co., at Marion Center, is about completed and coal will be shipped from the workings within the next few months.

Hillsboro—Two new coal plants are to be established in Somerset County. The Hurkin Coal Mining Co., has purchased a 30-acre tract and the Berger-Aiken Coal Co. has bought a big tract along the Casselman River in the vicinity of Rockwood. It is stated that both corporations contemplate putting plants in operation when the weather opens.

Johnstown—Bulletins were posted, on Jan. 12, by the Pennsylvania R.R. announcing that there is a surplus of box cars in this vicinity, and urging local coal shippers to use the closed rolling stock in all instances possible. It is likely that the bulk of the coal and steel will be shipped in box cars from this part of the state for the next few weeks.

The Vinton Colliery Co. has just purchased 5800 acres of coal land near its present holdings. This entire tract is underlaid with the same coal which is now being mined by this company, and most of it has another seam running low in sulphur. Work has already been started toward building a town, and opening two drift mines. These mines will be self-draining and operated electrically. They will probably be producing coal on quite a large scale by the first of April. The mines will be called "Vinton" No. 11 and "Vinton" No. 12, and will be served by both the Buffalo, Rochester & Pittsburgh Ry., and the Pennsylvania R.R.

Derry—A coal deal was recently consummated in the vicinity of Hillside, a short distance east of Derry, by which 300 acres of land belonging to Samuel Foster was sold to Seger Bros. for $375,000. Surface and coal were sold together it is said, for $1250 per acre. Several small tracts in the same region have been sold to Seger Bros.

Connellsville—Announcement was recently made that an embargo had been placed by the Baltimore & Ohio R.R. on all freight west of Pittsburgh, except engine fuel, Government freight and perishable goods. This means that many thousands of cars of coal and coke cannot be moved out of the region, further complicating the situation confronting the coke operators.

The present prosperity in the coal and coke business in this region has brought about many deals and transfers of property, and has caused the reopening of several works which were abandoned some time ago. Coal lands near the McClure Plant on the Mt. Pleasant branch of the Baltimore & Ohio have been reopened by the Valley-Connellsville Coal and Coke Co. Also a new mine has been opened near Ohiopyle by Harry and William H. Marietta.

The coke production in the Connellsville and lower Connellsville region for the week ending Jan. 6, was 358,576 tons, an increase of 22 655 tons over the previous week. The shipments amounting to 354,575 tons are an increase of 28,599 tons.

Hamlin Station—The purchase of 13 farms in this section for the purpose of strip mining was recently completed by Aronson Bros., of Pittsburgh. The price paid for the land ranged from $50 to $75 per acre, and it is intended to begin stripping operations at once.

Khedive—A deal was recently consummated whereby the H. C. Frick Coke Co. purchased the coal under the village of Khedive. The price paid was at the rate of $500 per acre. This coal adjoins the block recently purchased by the Frick company from J. V. Thompson.

WEST VIRGINIA

Huntington—The New Rex Coal Co. and the West Virginia White Ash Coal Co. will shortly open offices in the First National Bank Bldg.

All records for the transportation of coal from the Kenawha River field to Cincinnati by boat were recently broken, according to local river men. The abnormal demand for coal because of the needs of manufacturing concerns working overtime and overburdening the railroad's abilities for handling fuel, are the probable reasons for the heavy river traffic. It is believed that heavy shipments will be continued throughout the winter.

Charleston—It was recently announced that the holdings of the Smokeless Coal Co. operating in Fayette, Fayette County, have been taken over by the Reliance Coal Co. The output of these operations is 350 tons per day. Improvements will be made in the property.

Williamson—N. H. Manakee recently started a corps of engineers to lay out a coal plant on the J. P. Harris lands at Chattaroy. This tract carries over 300 acres of good coal. There are also rumors of other new plants being installed in the near future, and it is said that Mingo County is on the eve of another period of rapid development.

Clothier—Deeds were recently recorded showing the transfer of 1200 acres on Coal River to C. R. Conner and T. T. Stiles, Jr., engineers, doing business under the firm name of Conner & Stiles. The property was purchased from the heirs of Isaac Faller, to which estate it had belonged for over 40 years. Only the poplar lumber had been removed, all the virgin hardwoods being left. It is understood that extensive developments of the underlying coal are planned.

Beckley—The Raleigh Coal and Coke Co., following the lead of the E. E. White Co., at Glen White, has announced that it will no longer employ drinking men. Employees of the company who become intoxicated will be discharged. Coal operators throughout this region have been campaigning against intoxicants for some time.

Fairmont—At a meeting of the Central West Virginia Coal Operators' Association held here recently, the following officers were elected: President, Cletus H. Jenkins, Fairmont; first vice-president, A. Lisle White, Adamston; second vice-president, R. B. Isner, Elkins; treasurer, C. J. Ryan, Hepsibah; secretary, D. R. Lawson, Fairmont. The members expressed themselves as well pleased with the distribution of cars effected during the past few weeks, and with the promises of the railroads to take care of requirements in the future, provided the operators waive insisting on back supplies.

KENTUCKY

Barbourville—Edward Purcifield, of Pineville, Ky., will re-open an abandoned mine near here.

Hazard—The largest individual output in the Perry county field for 1916 was made by the Kentucky Jewel Coal Co. which produced 116,000 tons. The Hazard field during the year produced 989,417 tons, almost double the production of a year previous.

The average daily output of the Hazard coal field during the month of December was 160 cars, or 9000 tons, according to Louisville & Nashville railroad officials. Two new operations, the Diamond Block Coal Co., and the Four Seams Collieries Co., are just now getting under way.

An unusual condition is found in the Hazard coal field, where all new orders for coal are at good prices even slack in some instances selling for $2.50 to $3 a ton. Local operators, being unable to fill orders for slack, have been buying the coal from small wagon mines and reloading on railroad cars. This has almost brought about a coal famine at Hazard, since the wagon mines have been hauling practically their entire output to the railroad station for shipment.

Elkhorn City—The Federal Coal Co. is rapidly getting into readiness to begin shipping coal from its new plant near here on the Carolina, Clinchfield & Ohio R.R., where it will have a capacity of from 800 to 900 tons daily to begin with. Shipments will be made over the Clinchfield Route.

Whitesburg—The Louisville & Nashville has named the new station of the Columbus Coal Mining Co. Allais, in honor of the president of the company. The new town of the Shelby Creek & Elkhorn Coal Co., on the Baltimore & Ohio R.R., has been christened Esco.

A record-breaking coal run for a single day recently passed over the Louisville & Nashville, en route to the markets of the Northwest. The day's business was a little over 18,000 tons, this being about 100 cars more than the previous record. Old contracts, which were placed at a low figure months ago, are now running out, and new contracts are being placed at the highest prices ever obtained for eastern Kentucky coal.

Lexington—At the annual meeting of the Hazard Coal Operators Exchange held here on Jan. 9, it was decided to ask the Louisville & Nashville R.R. to name a rating committee which would be charged with the duty of rating the output of the mines on its lines, cars to be distributed thereafter in pro-rated numbers. R. A. Hord, secretary of the organization, went to Louisville after the meeting to present the request of the organization to officials of the company. The matter of a lake route to the Northwest, which is before the Interstate Commerce Commission was discussed as was also the proposed weather bureau station in the Hazard field.

OHIO

Athens—At the public sale of the holdings of the Continental Coal Co. in Athens and Perry counties, under foreclosure proceedings, on Jan. 13, the New York Central Railroad Co., the only bidder, purchased the properties for $1,268,795, just 37c. more than the upset price fixed on the preceding day by the United States Circuit Court of Appeals at Cincinnati.

ILLINOIS

Alton—P. W. Coyle, in an address to business men here on "Traffic," told of the conditions that had produced freight congestion and car shortage and said that there was one way in which the small shipper could do his part to relieve the situation, and that was to keep his sidetracks clear of empty cars. The temptation to pay demurrage, he said, so as to have cars when needed, was strong, but that policy reacted by adding to the difficulties of the general situation.

Sparta—The fanhouse of the Illinois Fuel Co.'s mine was recently destroyed by fire, closing down the largest mine on the Illinois Southern Ry. and forcing the mining company's large contract consumers in the southeast Missouri lead belt to go on the open market for their fuel at prices about 3 times their contract figure.

Collinsville—The sheave wheel shafting on the top of the tipple of mine No. 17 of the Consolidated Coal Co. of St. Louis, snapped on Jan. 11, allowing the two cages to go to the bottom and taking a large part of the upper headgear of the tipple with them. No one was injured. The mine will be shut down for some time.

Herrin—The mine at Cambria known as the Carterville & Big Muddy Coal Co. property, now operated by interests allied to the Ellis Stores Co. of this place is expected to be sold outright shortly, to the St. Louis Coal Co. of St. Louis, which is handling the output and has a short time option on the property. The price asked is slightly under $50,000. It is one of the oldest operating mines in Williamson County and is on the extreme western edge of the No. 6 seam.

Hallidaysboro—The Jackson Coal Co. recently had part of its washer plant torn down, which is north of the tipple, by a large loaded car which extended out from the tracks to such an extent that it tore away the lower portion of the washer plant, forcing a suspension.

Springfield—The Sangamon County Coal Co., recently incorporated, has changed its name to the Sangamon County Mining Co., in deference to the objections and the injunction suit brought by the Sangamon Coal Co. to the former name. The Sangamon Coal Co. is an old firm. When a certificate of incorporation was issued to the Sangamon County Coal Co., the Sangamon Coal Co. protested to Secretary of State Stevenson. The protest was fruitless and the Sangamon Coal Co., by its president, Howard K. Weber, filed an injunction suit. The new company, anxious to begin business but hindered by the litigation, agreed to change its name to the Sangamon County Mining Co., and the suit was dismissed. The new company is composed of Thomas G. Deering, T. H. Cochran and W. A. Brewerton.

For the first time in the memory of mining men, screenings sold for a dollar more a ton than lump coal at the Springfield mines recently. Lump coal was sold at $3 a ton. Screenings brought $4 a ton f.o.b. Springfield. They were sent to Michigan and the freight was paid by the purchasers.

Duquoin—W. A. LaFont of St. Louis has sold approximately 600 acres of strip coal lands north and east of this city on the outcrop of the No. 6 seam to E. J. Scott of John Scott & Sons, large strip mine operators of Pittsburgh, Kan. He has given option to the Hamilton Coal and Mercantile Co. of Weir, Kan., large strip operators in that field, on several hundred additional acres of strip coal lands southeast of here. These people are the most aggressive of strip mine operators in the Western states, and some big operations will be under way in this district in the spring.

Work has been resumed at the Security mine of the Rutledge & Taylor Coal Co. after an idleness since Dec. 23. The headgear at that time broke, which necessitated the building of a new headgear and tower together with braces. The tipple that was practically destroyed was a second-hand one that came from Bicknell, Ind.

Foreign News

Tokyo, Japan—It was reported on Jan. 13 that an explosion in the Fushun colliery in Manchuria had entombed 900 Chinese miners. Only 130 of these at last account had been rescued, and it was feared that the remainder had perished.

Michel, B. C.—Two more victims of the explosion in No. 3 East mine, Michel, last August, were recovered recently. Only one was identified, being Thomas Hampton, miner, who resided in the Pass for many years. Up to the present 11 of the 12 victims of the explosion have been recovered.

Frank, Alta.—The Franco-Canadian Collieries will within the next few days commence two horizontal diamond drill holes from its No. 2 gangway, about 5000 ft. inside the mine, to find the location of a 9 ft. seam the outcrop of which has been found 1200 ft. above on the surface, 175 ft. east of the great seam. An exploration rock tunnel driven several years ago to a distance of 800 ft. failed to show this seam. At least the only coal found was several leads none of which exceeded 12 in. in thickness. Prospecting was then abandoned until last fall, when the outcrop was traced for a distance of about 2000 ft. The geological formation of this region is still much of a closed book and it is to shed light on this subject and to determine whether or not there really is another seam that the two holes are being drilled.

Personals

Charles Severn, superintendent of the Russell Coal Co., at Clymer, Penn., resigned Jan. 1, 1917.

James McLane, of Spangler, Penn., recently purchased several acres of coal lying between Spangler and Nicktown.

George C. MacFarlane, superintendent of various coal operations at Barnum, W. Va., and Dodson, Md., recently resigned his position.

T. D. Beymon, of Flushing, Ohio, recently accepted the position of superintendent of the Gaylord No. 1 mine of the Pittsburgh & Cleveland Coal Co.

H. H. Sanderson recently opened an office in the L. C. Smith Building of Seattle, Wash., in which will be carried a complete line of safety equipment.

Joseph J. Sharteneker, formerly mine foreman for the Jamison company, at its No. 9 plant has resigned and will operate a coal business of his own near Clarksburg, W. Va.

John R. Caldwell, a prominent coal operator, who has been a patient at the Windber Hospital for a long time, is recovering rapidly and will be able to leave the hospital in a short time.

P. J. Malloy of Morea, Penn., who has been the purchasing agent for the Dodson interests operating collieries at Morea, Beaver Brook and Locust Mountain has been given charge of the stores of the company.

M. M. Tyree, formerly in the West Virginia Coal Co.'s office in Richmond, has been placed in charge of the office recently opened by this company in Huntington, W. Va. This office is located in the Robson-Prichard Building.

James H. Pritchard, who has been chief inspector and safety commissioner of the Ohio Mine Department for a year, has tendered his resignation, effective Feb. 1. He resigns to enter other business, which will be announced later. He took office Feb. 1, 1916.

F. S. Pfahler has tendered his resignation to the Southern Coal, Coke and Mining Co., to take effect Feb. 1. He is to become general manager for the mines of the Chicago & Northwestern Railway Co. in Illinois and Iowa. T. J. Adelsberger, paymaster of the Southern company, will be Mr. Pfahler's successor as general manager, with headquarters at Belleville, Ill.

Carl Scholz, president of the Coal Valley Mining Co., Chicago, is representing the Illinois operators in meetings held by the Associated Employers of Illinois, to discuss modifications of the Workmen's Compensation Act placed in effect two years ago. The Associated Employers are proceeding to obtain revisions of the act which will make it more fair to the employers of labor.

H. D. Easton, of Straight Creek, Ky., has resigned his position as general superintendent of the Federal Coal Co. of that place, to take up his residence at Tulsa, Okla., where he will join F. Julius Fohs, oil geologist. Mr. Easton is a graduate of Pennsylvania State College, was some 11 years ago chief engineer of the Rock Island Coal Co., in what was then Indian Territory, was later for some years assistant professor of mining engineering at the Kentucky State University, which position he left something over a year ago to accept the position with the Federal Coal Co. when that firm took over the properties of the bankrupt Continental Coal Corporation.

Obituary

A. D. Jenkins, president of Jenkins Bros., died on Dec. 29 last.

E. L. Shepley, vice-president of the Northwestern Fuel Co., at St. Paul, Minn., died recently.

Industrial News

Worcester, Mass.—The Lehigh Coal and Navigation Co. plans to make Worcester one of its principal distributing centers in this section of the country, having leased the Boston & Albany's railroad coal plant in that city.

Knoxville, Tenn.—The Southern Appalachian Coal Operators Association will hold its annual meeting in this city on Feb. 13. Important matters are to be considered and it is expected that 150 members will be in attendance.

Barnesville, Penn.—The installation of electrical equipment of approximately 800 hp. is being pushed at the newly acquired People's Mine of the Diamond Coal and Coke Co. This installation is being made by the West Penn Power Co.

Monangah, W. Va.—Another coal mine is now being opened near Mine No. 8 by T. D. Berton, William Cornell and Clyde Satterfield. Materials are being placed on the ground for the necessary construction. These people expect shortly to be hauling coal to the Monangah Station for shipment.

Columbus, Ohio—A resolution was recently passed by the City Council, to urge the passage of a law by the State Legislature now in session permitting cities to own, operate and lease coal mines. Recently the city attorney handed down the opinion that this could not be done under existing statutes.

Chicago, Ill.—The Electrical Material Co. has succeeded the W. R. Garton Co. of 17 S. Des Plaines St. The new firm has removed its offices to 618 W. Jackson Blvd. The officers of the new company are Ray P. Lee, president; E. Lewis, vice-president; A. F. Henderson, secretary; G. J. Traner, treasurer.

Washington, Penn.—The McLane Mining Co. has acquired the property of the Meadowlands Coal Co., at Meadowlands, Washington County, Pennsylvania, about 5 mi. from Washington. This was abandoned about six months ago. The new owner has reopened the mine, and is working out the pillars. Purchased electric power will soon be installed.

St. Louis, Mo.—Officials of railroads operating eastward from St. Louis report that there is little change in the traffic situation. They say that the roads have all the business that they can possibly handle in both directions. Scarcity of cars, they say, is the only thing that limits their business. Officials of Southern roads report that traffic is about the same as at this time last year.

Nashville, Tenn.—President Peyton, of the Nashville, Chattanooga & St. Louis Railroad Co., has announced his approval of plans for the construction of 13 mi. of new railroad, tapping the coal section of Grundy County. Construction work has already begun. The new line will extend from Coalmont, northeast to Mill Creek, near Tatesville, and will be an extension of the company's Tracy City branch.

Columbus, Ohio—Mandamus proceedings were begun in the United States Court of Appeals by the Hocking Valley Railway Co. recently, to compell its admission as a party defendant to the foreclosure proceedings now pending in Columbus against the Continental Coal Co. It seeks also to appeal from the order of the United States Circuit Court to sell the properties of the coal company at public auction.

Charleston, W. Va.—It is rumored that the Virginian Railway Co. will equip its road with electric locomotives. It is said that the Virginian will operate electric locomotives between Elmore and Clarks Gap. Heavy coal trains are being hauled over this section of the road. It is also said that the Western Maryland R.R. is contemplating the electrification of its lines on the heavy grades of the Blue Ridge Mountains.

St. Louis, Mo.—C. W. Nelson, St. Louis representative of the Commission on Car Service, reports an improvement in the car situation in the Southwest, particularly in Arkansas, Oklahoma, Texas and Louisiana. Coal cars are being released in greater numbers by the stoppage of road work and like improvements affected by weather conditions. This will tend to relieve the fuel shortage throughout the plains states.

Clearfield, Penn.—Attorneys representing the Pennsylvania Railroad Co. and the Sonman Shaft Coal Co., met in the prothonotary's office recently, where the railroad company gave its check for $188,339.71, in settlement of the judgment obtained against it by the Sonman company in the discrimination case which has been carried through many courts. This is one of the largest verdict payments ever received in Clearfield County.

Seattle, Wash.—Forty-five men have enrolled in the 20th annual three-months' mining session at the College of Mines, University of Washington, Seattle. Their ages vary from 21 to 56 years, averaging 33 years. All but ten of the men have had mining experience. They register from all parts of the Pacific Coast, from Arizona to Alaska. Quartz miners are in the great majority but several placer miners are present and a few coal men.

Smithton, Penn.—The Alberta Coal Co. has opened a stripping near Jacobs Creek, Penn. An Erie steam shovel is on the ground and has begun the stripping. It is said that 20 acres of coal lies near the top of the hill, where the cover has been so light as to render ordinary methods of mining unfeasible. This coal is about 9 ft. thick and has excellent steaming qualities. The product of the pit will be lowered down a chute from the top of the hill to the Baltimore & Ohio R.R. track.

Tuscaloosa, Ala.—The Alabama Insane Hospital, should the plans of some of the trustees be carried out, will shortly be mining coal at practically the door of the boiler room to be used as fuel in the plant. On account of the excessive demand for fuel, the price has been raised to the institution to nearly $6 per ton, and it is said that by an expenditure of approximately $7500 a shaft may be opened and a saving of more than this amount made in one year. This proposition will probably be taken up by the board of directors in the near future.

Toronto, Canada—The Canadian Department of Railways announces that, owing to the increased volume of traffic on the Intercolonial Railway and the decreased output of the Nova Scotia coal mines, it will be necessary for the government to purchase large quantities of coal in the United States at $10 per ton, or about three times the contract price of the Nova Scotia coal. Owing to the shortage the company has been compelled to confiscate a large quantity of coal that was being carried to private consumers, and it is feared that if this practice were continued it might seriously curtail the output of the steel works, munition plants and other factories of eastern Canada. The government decided that rather than do this it would incur the increased expense of procuring supplies in the American market, which will amount to about $300,000.

Pottsville, Penn.—The mines were a long time adopting a useful utility which the steel mills and foundries have long had in use. Locomotive cranes with clam-shell buckets are a familiar sight around the above industries and now the Buck Run Coal Co. has put one into use at its Buck Run Colliery, and the Philadelphia & Reading Coal and Iron Co. has placed one at its big Pine Knot operation. That they do not come into more general use is remarkable when their varied uses are considered. At Buck Run, the hoist loads barley and buckwheat coal, shoves "back" overrun gondolas under the breaker, unloads the heavy mine timber from the cars, also all heavy castings and can be used to handle ashes, from the boiler pit. The unloading of heavy mine timber by the hoist is a decided improvement over the old method and releases the laboring gang from this work which is a big item in these times of labor shortage.

Market Department

GENERAL REVIEW

Anthracite stiffens up under the influence of the colder weather though supplies are fair. Bituminous contract prices range from $3@3.50. Buyers becoming nervous and sales agencies limiting commitments. Spectacular measures adopted to relieve an acute situation at Chicago.

Anthracite—Severe weather conditions over the early part of the week stiffened the trade notably. Embargoes against some districts have tightened the situation there, but have also served to divert additional tonnages into other markets where conditions are now much easier. Premium prices are still generally the rule, though not in such amounts as prevailed when supplies were shorter. Demand at the moment is centering more particularly on steam sizes. The embargoes at most of the Tidewater points have been lifted, and loading is more rapid. Car supply has been notably better since the holiday suspension, while the mines have also got back into their stride, with the result that shipments are substantially better all along the lines. While a good many retailers are still working on a hand-to-mouth basis, they are becoming more confident of being able to carry through until the situation eases up. Orders for domestic grades are consequently lacking the urgency that might be expected at this time.

Bituminous—Interest in the soft-coal market is centering more and more on contract negotiations, quotations so far being firm at $3 to $3.50. Two contracts aggregating 200,000 tons were reported closed for some high-grade coal at $3.50 per ton, and a good many agencies are receiving offers ranging from $3 to $3.50, but there is considerable hesitancy about closing on both sides. Most consumers are resigned to higher fuel costs, but the selling agents anticipate big opportunities in the prompt market over the next 12 months, and are inclined to limit their commitments even to old customers. In the meantime the prompt market has eased up still further, our table of comparative average prices showing a decline of 20c. per ton for this week, which compares with a decline of 42c. the week before, making the total loss on this movement 62c. per ton, and bringing quotations back to the lowest level since Dec. 16. Improved car supplies following the holiday suspension, together with intermittent periods of mild weather and increased shipments at the mines, have all tended to relieve the urgent pressure for coal which has been responsible for the unusually high price levels.

Lake Trade—The colder weather has increased the demand, accentuated the transportation difficulties, and stiffened up the market very perceptibly. More drastic embargoes are in effect, while the new demurrage rules have tended to reduce the tonnages at distributing centers, increasing the difficulties of large steam consumers with restricted storage facilities. The situation at some Canadian points is especially critical, and railroads in that section have been cancelling passenger trains in order to increase the motive power available for the movement of freight. Retailers were able to increase their reserve stocks slightly during the lull of last week, but these are still substantially below the average for this period of the year. There has been some activity in chartering for Lake shipments next season about 500,000 tons having been covered at a very substantial increase over previous rates. On new coal contracts, consumers appear to be more concerned than the sales agencies, the latter being very cautious about fixing prices and committing themselves for any important tonnages.

Middle Western—The market is fluctuating according to weather conditions, the high temperatures of last week occasioning a slump, though this was rapidly overcome by a return of colder weather again, which precipitated the most acute situation of the season at Chicago. The steam demand continues as urgent as ever and there are still heavy shipments to the Northwest while the railroads in that section are confiscating considerable coal. The car supply was a trifle easier during the warm spell, but is once more very irregular. The railroads are putting out a number of inquiries for surplus tonnages for storage purposes on Apr. 1. Negotiations on new contracts are progressing slowly, due to many uncertainties, but the current indications are that minimum figures will show a very substantial increase over the normal prices of expiring contracts. Even larger increases are being mentioned on Eastern coal, due to the very strong market for those in their own section.

A Year Ago—Urgent demand for anthracite, particularly at down-east points. Exports show a large increase. Transportation problem becoming more serious inland. Heavy demand in the Middle West.

Comparative Average Coal Prices

The following table gives the range of mine prices in car lots per gross ton (except where otherwise noted) on 12 representative bituminous coals over the past several weeks and the average price of the whole group for each week:

Boston	Last Year	Jan. 20	Jan. 13	Jan. 6	Dec. 30	Dec. 23
Clearfields	$2.75@3.25	$4.75@5.60	$4.75@5.60	$4.75@5.60	$4.75@5.75	$4.75@5.75
Cambrias and Somersets	3.50@3.50	5.00@5.65	5.00@6.00	5.00@6.00	5.25@6.25	5.25@6.25
Pocah. and New River[1]	2.85@2.90	6.50@7.00	6.75@7.25	7.00@7.50	7.25@8.00	7.00@7.50
Philadelphia						
Georges Creek	3.10@3.25	6.00@6.50	6.50@6.75	6.50@6.75	6.00@6.25	6.00@6.25
W. Va. Freeport	2.45@2.50	5.25@5.50	5.75@6.00	5.75@6.00	5.00@5.25	5.00@5.25
Fairmont Gas mine-run	2.10@2.15	5.25@5.50	5.50@5.75	5.75@6.00	5.25@5.50	5.25@5.50
Pittsburgh (steam coal)[2]						
Mine-run	1.40@1.75	4.25@4.50	4.00@4.25	5.00@5.25	4.25@4.50	4.25@4.50
¾-in.	1.50@1.85	4.25@4.50	4.00@4.25	5.00@5.25	4.25@4.50	4.25@4.50
Slack	1.35@1.60	3.75@4.00	3.85@4.00	4.95@5.05	3.50@3.75	3.50@3.75
Chicago (Williamson and Franklin Co.)[2]						
Lump	1.60@1.75	3.50@4.00	3.75@4.00	4.00@4.50	3.75@4.50	3.75@4.25
Mine-run	1.10@1.15	3.00@3.50	3.50@3.75	4.00@4.25	3.75@4.00	3.50@3.75
Screenings	.75@.80	3.00@3.50	3.50@3.75	4.00@4.25	3.75@4.00	3.50@3.75
Gross average[3]	$2.04@2.20	$4.54@4.98	$4.74@5.11	$5.16@5.53	$4.73@5.19	$4.67@5.08

[1] F.o.b. Norfolk and Newport News. [2] Per net ton. [3] The highest average price made last year was $4.80@5.33 made on Nov. 25.

BUSINESS OPINIONS

Iron Age—An interesting development, showing the intense effort to increase Canadian output, is the contract just closed by the Imperial Munitions Commission for Canada for ten 8-ton Heroult electric furnaces for a plant to be built at Toronto for the commission and to operate on the scrap steel of munitions works. At the same time there are negotiations with domestic steel manufacturers, with the usual maneuvering over prices, for good-sized tonnages of shell steel forgings for the Allies. Third-quarter delivery is wanted for the most part, and in some cases second-half.

American Wool and Cotton Reporter—To take the place of the Australian wool used in making worsteds, noils made from this same wool are now being bought in large quantities to make a woolen cloth. It is said that clothing almost or quite as good can be made in this way. High prices are being made for contracts for noils.

Dun—With the end of the holidays and annual settlements, business has regained momentum in many branches and sections, though wholesome conservatism and caution are everywhere manifest. Each week the question of future economic readjustments enters more largely into calculations, and doubts as to the changes that must ultimately be effected cause hesitancy both in legitimate trade and industry, and in speculation. Commercial failures this week are 359, against 312 last week, 254 the preceding week and 453 the corresponding week last year.

Bradstreet—While there is some evidence of conservatism born of desire to avoid stocking up with high-priced goods, trade is beginning to throw off the seasonal lethargy incident to the post-holiday period. Salesmen are again on the road, and buyers are in the more important markets sizing things up, the price situation, which continues to swing upward as regards staple articles, rendering it essential for buyers to deliberate with caution. However, talk of early peace in Europe has been all but ended by the reply of the Entente Allies, and thereby some hesitancy as to the future has been diminished. Over a large part of the West trade is relatively brisk for this season of the year, large orders heretofore received denote confidence, merchants are asking for prompt shipments and collections are good.

Dry Goods Economist—Buyers are now in the market for the many lines which are purchased at this time for spring. The great influx, however, is not expected to begin until next week. The question of future prices continues to receive general attention. On this point retailers and manufacturers are largely at variance. Many thoughtful men among the former continue to advocate a policy of conservatism, while the latter assert that dilatory buyers will find themselves at a disadvantage."

Marshall Field Co.—Wholesale shipments of dry goods for the current week are in equal volume to the corresponding period of a year ago. Road sales are about even with the same week of 1916. Many customers have been in the market during the week and noticeable among them were large furniture and floor-covering buyers. Collections are in excess of the same week last year.

Atlantic Seaboard

BOSTON

Contract price program clearly outlined on Hampton Roads coals but no reports of purchases thus far. Georges Creek unchanged. Contract situation with the operators somewhat mixed. Anthracite deliveries still very slow, but mild weather helps out meager stocks.

Bituminous—The week has shown very little change in the general situation. Receipts at Tidewater are gradually recovering from the holiday set-back but there is no amount of spot coal worth mentioning and the attitude of the agencies is just about as close-hauled as ever. Few commitments are being made for any period ahead and even at the $4.75 announced price forward from Apr. 1 the shippers seem diffident about taking on business; their view is that it will be a sellers' market for several months to come. Inquiry is still strong from South America, and while that continues the various factors will confine coastwise deliveries to old contracts and leave the question of new business in New England till later.

Delivered prices for twelve months from Apr. 1 are now being named by some of the more important interests here. Those who own their own marine transportation have apparently settled upon a rate of $2, Hampton Roads to Providence, and $2.25, to Boston. This is inferred from a $7 price on cars Providence and $7.25 f.o.b. Boston, the basis on which next season's business is now being canvassed. The differential over last year's level is so great that New England consumers are going to be slow about purchases. The whole outlook is very puzzling for the buyer; in most cases he is willing to pay high prices if he can be assured competitors in the same line are going to pay as much or more, if they wait.

The spot market shows no new developments. Pocahontas and New River prices range from $6.50@7 f.o.b. and $9@9.25 alongside Boston. Offerings on the latter basis are very rare, although scattering sales are made on cars Boston, Providence, and Portland at $9.25@9.50 on cars. All-rail deliveries from Pennsylvania are on a lower basis and form an inducement to consumers to purchase in that direction wherever possible. Movement all-rail has improved enough so that supplies from this source are really a factor in points hitherto regarded as exclusively supplied by water.

In some of the Pennsylvania regions the wage difficulties have been patched up and larger output is expected. In a few instances advances amounting to more than 30% were granted, the subject being frankly put up to customers who had coal due them at prices based on the wage scale agreed upon last spring. Even with such an advance which amounts to nearly 60c. per ton the coal purchased early last fall is still much cheaper than inferior grades are commanding in the spot market.

The continued shortage of labor has made operators most conservative about new contracts. The last eighteen months production has failed

to meet expectations, and it is idle to oversell in a market like this.

Bituminous at wholesale is quoted about as follows, f.o.b. loading ports at points designated, per gross ton:

	Clearfields	Camb. & Somerset
Philadelphia	$5.90@6.75	$6.25@6.75
New York	6.10@7.00	6.55@7.10
F.o.b. mines	4.75@5.60	5.00@6.25
Alongside Boston (water coal)	8.00@8.50	8.25@8.75

Pocahontas and New River are quoted at $6.50 @7 f.o.b. Norfolk and Newport News, Va., for spot coal, and $9.25@9.50 on cars Boston and Providence for inland delivery.

The coal received at Boston over all routes for year ended Dec. 31 were 1,773,495 tons of anthracite as compared with 1,702,402 tons in 1915, and 5,368,868 tons of bituminous as compared with 5,129,936 tons in 1915.

Anthracite—Shipments are improving slightly as compared with a week ago, largely because more collieries have been at work and car-supply was increased by the holiday suspension. New York loading is still notably poor as the railroads are congested with all kinds of traffic. All sizes are short and most retailers here are getting along on a hand-to-mouth basis. Many of the Tidewater dealers are striving to get forward small supplies, all-rail in order to piece them out.

NEW YORK

Demand for the small anthracite coals urgent with small tonnage available. Domestic grades quiet but prices firm. Bituminous demand good but production is light. Contracts being closed. Export inquiries numerous.

Anthracite—The chief interest in the anthracite situation is centered in the buckwheat sizes, on which the demand is the heaviest with quotations higher. Individuals with any of the small coals available find a quick market for their holdings and get nearly as much for buckwheat No. 1 as for the cheaper grades of pea coal. There is a shortage of all the small coals, and some shippers have no rice or barley to offer at any price.

Another feature of the market is the slow demand for the domestic coals and the continuing high prices paid for Tidewater deliveries for the individual product. There is not the usual insistence for rush deliveries at this season and dealers are not showing any desire to load up with premium coal. Even colder weather has no effect on demand or prices.

There is a brisk demand on New York houses from Canada, but the New England situation is quiet, dealers there apparently waiting for the April discount. New England dealers bought heavily of premium coal in November and December some of which is still on the road.

The local Tidewater piers are free of embargoes and loading is easier. There is not much demand from Long Island points but water shipments to New England are heavy.

Current quotations, per gross ton, f.o.b. Tidewater, at the lower ports are as follows:

	Circular	Individual
Broken	$4.95	.....
Egg	5.45	$7.50@7.75
Stove	5.70	7.50@7.75
Nut	5.75	7.50@7.75
Pea	4.00	7.00@7.25
Buck	2.75	6.50@7.00
Rice	2.20	4.50@5.00
Barley	1.95	3.25@3.50
Boiler	2.20	.....

Quotations at the upper ports are generally 5c. higher on account of the difference in water freight rates.

Bituminous—Demand for bituminous continues steady but there has been a further softening in prices. Weather conditions have relieved the transportation difficulties and the loading situation at the various Tidewater piers is easier. The numerous embargo orders have been removed and shippers are having very little trouble in getting shipments forward, provided they have the coal on hand.

Production continues light, the mines only working half time at the best. Car supply shows a slight improvement, most operators getting from 50 to 60 per cent. of their normal requirement.

There is much activity in the closing of contracts with $3.50 at the mines as the basis for good coals and $3 for the cheaper grades. Two contracts aggregating 200,000 tons were closed this week for South Fork coal at $3.50 per ton.

Large consumers are complaining of lack of supplies and some industrial plants, are understood to be working with less than a two days' supply ahead.

There is a good demand for export coal notwithstanding the high ocean freight rates. Bunker coal is more plentiful and no great delay is experienced in coaling the liners for a round trip.

Current quotations, per gross ton, f.o.b. Tidewater, for various grades are as follows:

	South Amboy	Port Reading	Mine Price
Georg's Crk.			
Big Vein	$7.50@7.75	$7.50@7.75	$6.00@6.50
Tyson	7.25@7.50	7.25@7.50	5.50@6.00
Clearfield	7.00@7.25	7.00@7.25	5.00@5.25
South Frk	7.25@7.50	7.25@7.50	5.25@5.50
Nanty Glo	7.25@7.50	7.25@7.50	5.25@5.50
Som'r. Co.	7.00@7.25	7.00@7.25	5.00@5.25
Que'ho'ing	7.25@7.50	7.25@7.50	5.25@5.50
W. V. Fa'rm't			
Th'r'qua	7.00@7.25	7.00@7.25	4.75@5.00
Mine-run	7.00@7.25	7.00@7.25	4.50@4.75
West. Md.	7.00@7.25	7.00@7.25	4.75@5.00

PHILADELPHIA

Anthracite situation temporarily relieved by heavy shipments. Mild weather followed by cold wave stimulates retail business. Small tonnage of premium coal. Steam coal very active. Bituminous prices slightly lower. Some contracting under way.

Anthracite—Just as the market approached its most critical state with dealers' stocks at their lowest ebb, the embargoes on shipments to New England and Western points diverted much extra tonnage in this direction. The dealers on the Philadelphia & Reading Ry. were particularly favored and are now carrying much larger stocks than their competitors on the Pennsylvania R.R. We know of dealers who received notice of shipments of as many as 40, 34 and 18 cars in a single day. The fact that car service accumulated before the cars were unloaded did not cause any refusals, although some dealers held their orders for a few days, because of the difficulty in unloading frozen coal and the scarcity of labor. The dealers on the Washington Ave. tracks of the Pennsylvania R.R. were embargoed, and as a consequence their yards are nearly barren though it is expected that the embargo will last only a few days.

Mild weather had materially weakened the retail demand, but as their stocks were so reduced this was not reflected in the wholesale market. Before the cold wave arrived last week the individuals reported a falling off in prices to levels which would have been entirely ignored during the first part of the year. While the premiums obtained are considerably less there are still plenty of instances of 15 and 20c. being asked for all sizes, and in one particular case as much as $6.50 was paid for stove coal. However, there is no very great tonnage being sold at excess figures.

Coal is not plentiful, but many of the most urgent cases have been relieved and the greatest sufferers now are those who cannot look to the big companies for coal. However, several of the small houses are doing very well by their most loyal trade. One of the surprises of the market has been the particularly poor shipments made into this territory by one of the largest companies. This company for some reason seems to have ignored their trade, although during the past week their shipments began to show some improvement.

A number of the individual companies with special coals have recently issued circulars increasing their prices. One company made an increase of 25c. per ton, while others have increased 10c. a ton.

Once more the retail man is to be investigated. During the week the most blatant of the local newspapers discovered the fact that some dealers had been charging 25c. a ton extra since Dec. 20. Immediately the usual cry of collusion was raised and an investigation demanded, which has now been promised from three sources: The U. S. Government, the city authorities, and the Anthracite Tax Commission.

Egg and stove coal remain the most active and shortest. Chestnut is scarce, but not so short as the two larger family sizes. Pea is still in very active demand, but like chestnut has been shipped rather freely the last ten days. There are many retailers whose stocks are dangerously low, particularly among the small dealers. None of the shipping companies are catching up with the demand for steam sizes. All the storage yards are nearly cleaned up on steam coal and shipments are confined to fresh-mined coal.

All sales agencies report their accounts in most excellent condition and state that collections are now the least of their worries.

Prices per gross ton f.o.b. mines for line shipment and f.o.b. Port Richmond for Tide shipment are as follows:

	Line	Tide		Line	Tide
Broken	$3.60	$4.75	Buck	$2.00	$2.90
Egg	4.15	5.25	Rice	1.25	2.15
Stove	4.10	5.60	Boiler	1.10	2.00
Nut	4.50	5.55	Barley	1.00	1.90
Pea	2.80	3.70			

Bituminous—The market lost some of its edge this week and there has been a slight falling off in prices, the recessions affecting all grades and running from 25 to 50c. a ton. This is no doubt due to the extremely mild weather which has also enabled the railroad companies to move large tonnages. Nevertheless with the ability of the market to absorb coal not a bit curtailed it is expected that the extreme demand will continue unabated up to Apr. 1, if not beyond.

Tide shipments have fallen off very materially of late, especially to foreign ports, as freights continue almost prohibitive. Reports have reached here that public utility plants in some of the countries on the west coast of South America have been forced to shut down for frequent periods on account of fuel shortage.

For the time being the labor difficulties in western Pennsylvania have been adjusted by the companies allowing the men a 10% bonus beginning Jan. 1. This comes as a particular hardship to those companies who have a large proportion of their production under contract. These contracts were made shortly after the new wage agreement with the miners several months ago.

The car supply recently has improved somewhat, and some operations report as much as 35 to 40% requirements.

There is no particular change in the contract situation. Many of the consumers are anxious to enter into contracts at the $3.50 figure announced by the larger companies, but this price, covering as it does the better grades of coal, is being strictly confined to old customers, and even then at a reduced tonnage. Of course there have been some few contracts closed around $3 but these have been for inferior grades. Most of the offices are flooded with contract inquiries daily, the consumer usually stating that he is willing to close at some figure between $3 and $3.50, but these offers are generally declined. Many shippers who have usually contracted for large tonnages are likely to go into the spring with a larger quantity of free coal than ever before.

The prices per gross ton f.o.b. cars at mines are as follows:

Georges Creek Big Vein	$6.00@6.50
South Fork Miller Vein	6.00@6.50
Clearfield (ordinary)	5.75@6.00
Somerset (ordinary)	5.75@6.00
West Va. Freeport	5.25@5.50
Fairmont gas, lump	5.50@5.75
Fairmont gas, mine-run	5.25@5.50
Fairmont gas, slack	4.50@4.75
Fairmont lump, ordinary	5.00@5.25
Fairmont mine-run	4.75@5.00
Fairmont slack	4.50@4.75

BALTIMORE

Better supply at tide had no tendency to break stiff prices here. Cold weather boosts the anthracite demand. Export movement fair.

Bituminous—While the car supply in coal regions dropped as low as 70% there was a better supply of coal at tide, due to a quicker movement. There was no over-stocking, however, and all fuel on hand was readily absorbed. Prices held firm and there was little haggling, as the consuming public is coming to regard the new rates as more or less of a fixture. More trouble is being had with contracts which are now beginning to come up for renewal. Consumers are objecting strenuously to quotations on year-round business of from $3 to $3.50 but nearly all the higher grade coals are being held firm at the latter figure.

Following are quotations, mine basis to the trade, for coals of interest here for local consumption and export: Georges Creek Tyson, $6.00; Quemahoning, $5.50 to $5.75; South Fork, $5.50; Somerset, $5.50; Clearfield, $5.00; Freeport, $4.50; Fairmont gas, ¾, $4.75; same, run-of-mine and slack, $4.50.

Anthracite—Snows and real wintry temperatures are causing additional tightness in the hard coal business. Not only is the mid-winter demand now brisk, but many of the consumers are opposing the policy of giving them but part of their orders at a time. The coal men have had to adhere to this in many cases, however, as they are still paying premiums at times on particular sizes which are in specially active demand.

Exports—The movement on export continues fair. For several weeks it has averaged above 15,000 tons, and the month's shipment will probably run above the 70,000 ton mark. Very little of this coal is now going to Europe, as South America is taking the bulk of the foreign shipments.

Ocean Shipping

COASTWISE FREIGHTS

Three dollars is still nominally the quotation for barges, Hampton Roads to Boston, for prompt loading, but charters are few. It seems settled now among steamship owners whether involved in the sale of coal or not that $2.25 to Boston will be a reasonable rate from Hampton Roads for the twelve months beginning Apr. 1, and $2.25 to Providence.

Freights from New York to Long Island Sound points are quoted at $1.15@1.20, but rates less than that can be obtained when coal is promptly available. Few barges are taken on account of the risk of prolonged detention.

OCEAN FREIGHTS

The freight market is even firmer than a week ago and freight rates continue to advance owing to the scarcity of tonnage. During the past week a steamer was chartered for coals to Buenos

Aires at $21.60 and this rate is freely offered for additional boats. Two or three steamers were also chartered for coals to Kingston at $7 per ton. There were no other fixtures reported.

We would quote freight rates on coal by steamer as follows:

	Jan. 8	Jan. 15
West Coast Italy	$43.20@48.00	$48.00 about
Marseilles	42.00@46.80	46.80 about
Barcelona*[2]	28.80 about	28.80@31.20
Montevideo	21.60 about	22.80@24.00
Buenos Aires	21.60 about	22.80@24.00
Rosario	22.80@24.00	24.00@26.40
Rio Janeiro	[3]17.00@18.00	[3]17.00@18.00
Santos	18.00@19.00	[3]18.00@19.00
Chile (good port)	10.00@12.00	12.00@14.00
Havana	4.25@4.50	4.25@4.50
Cardenas, Sagua	5.50 about	6.00 about
Cienfuegos	6.00@6.50	6.00@6.50
Port au Spain	8.50@9.00	9.00 about
St. Lucia	8.50@9.00	9.00 about
St. Thomas	7.50@8.00	8.00 about
Barbados	8.50@9.00	9.00 about
Kingston	6.75@7.00	7.00 about
Curacao[1]	7.25@7.50	7.50 about
Santiago	6.00@6.50	6.50 about
Guantanamo	6.00@6.50	6.50 about
Bermuda	6.00 about	6.00 about
Vera Cruz	8.00@9.00	8.00@9.00
Tampico	8.00@9.00	8.00@9.00

* Spanish dues for account of cargo. [1] And p.c. [2] Or other good Spanish port. [3] Net.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge."

W. W. Battie & Co.'s Coal Trade Freight Report.

VESSEL CLEARANCES

The following vessels have cleared with coal cargoes during the past week:

PHILADELPHIA

Vessel	Destination	Tons
Thor	Santos	
Tabor	Fort de France	
New Orleans	Panama	
Lodaner	Havana	2,106
Gulfaxe	Santiago	
Com. Rollins	Havana	

BALTIMORE

Doris	Argentina	2,111

PANAMA CANAL

Fuel movement through the canal for the two weeks ended Dec. 29 was as follows:

Vessel	From	To	Tons
Framl'gton Ct.	Cardiff	Pacific Ocean	5,350
G. Washington	Norfolk	Tiburon	9,121
Genmorag	Cardiff	Pacific Ocean	[1]7,300
Lime Branch	Baltimore	Callao	[2]6,471

[1] Coal and general cargo. [2] Coke and iron.

OCEAN CHARTERS

Coal charters have been reported as follows during the past week:

BALTIMORE

Vessel	Destination	Tons	Rate
Samuel P. Bowers	Vita, Cuba	526	
..... [1]	River Plate	5,000	$18.60[2]
H. Luckenbach	Rio Janeiro	1,799	17.00

HAMPTON ROADS

G. Deering[3]	San Juan, P. R.	1,714	6.00[4]
M. Thomas	Pernambuco[5]	1,161	16.00[4]
E. B. Douglas	Para	910	13.00

NEWPORT NEWS

Oregonian	Rio Janeiro	

ATLANTIC RANGE

Felix Taussig[6] [7]	River Plata	9,000	21.60[7]

[1] Or Virginia. [2] 1000 tons discharge. [3] Two trips. [4] At or about. [5] Or Bahia. [6] Sublet. [7] January or February.

Ohio Valley

PITTSBURGH

Spot coal higher again, due to increased demand and car shortage. Occasional contracts at still higher prices.

The spot coal market has stiffened 25@50c. since last report, owing to heavy demand and increased shortage of cars. The winter weather that set in about the middle of last week did not result immediately in greatly decreased car supplies, but by Saturday the shortages had generally increased and this week opened with cars decidedly shorter than at the beginning of last week, but with increased demand.

Consumers appear to be more concerned over the matter of twelvemonth contracts than producers, for there has been some additional contract buying even though the operators are proceeding slowly toward the fixing of a circular price for the contract period. Advices still are that the leading operators contemplate a circular price of about $3 for the twelvemonth to begin Apr. 1, with some concessions in the case of large buyers, say to $2.75. On the other hand there were circumstantial reports a fortnight ago of some twelvemonth business, beginning Apr. 1, being put through at $3 and also at $3.25, while the first of this week it was positively reported that two fair sized contracts have been closed, one at $3.50 for the twelvemonth beginning Apr. 1 and one at $4 for the 15 months Jan. 1, 1917, to Apr. 1, 1918, the price being higher in the latter case because the delivery embraces parts of two winters. It is stated that this buying was by consumers who did not want to wait until the regular market was opened.

The Baltimore & Ohio has put on an embargo as to all shipments west of Pittsburgh. Some shippers have loaded cars in the Youngwood yards, which in consequence cannot be moved.

We quote spot coal at $3.75@4 for slack, $4.25@4.50 for steam, mine-run, and $5@5.25 for ¾-in. gas, per net ton at mine, Pittsburgh district.

BUFFALO

Bituminous—The market sags in an irregular way and is now down something like $2 from its highest point. There are embargoes everywhere and a considerable fall of snow has contributed to the difficulties of the railroads. It is growing more difficult to get coal into Canada or New England. The winter has been continuous in this territory for more than five weeks and yet the middle point, as usually reckoned, has not yet been reached. It looks as if the day of plenty of coal was remote.

Much difference still exists as to prices. A variation of as much as a dollar still exists, with perhaps all parties equally positive that their figures are correct. A good average would be based on $5.50 net at the mines for Pittsburgh three-quarter, as follows:

Youghiogheny Gas	$6.75@7.25
Pittsburgh Steam	6.50@7.00
Ohio No. 8	6.50@7.00
Allegheny Valley	6.25@6.75
Pennsylvania Smokeless	6.40@6.90
Cambria Co. Smithing	6.45@6.95
All Slack	6.35@6.85

Anthracite—The city market is in good condition, but it is next to impossible to keep the outlying districts in coal, for the reason that the railroads are unable to handle it. There is always some congested center, like Black Rock, shutting off Canada, which it is impossible to pass without a serious delay. Some roads run their trains past such points if they can, but that is not always possible.

Buffalo still declines to pay the premiums asked for independent anthracite, though some brokers report that they are getting $2.50 for it in certain remote markets. There is great scarcity reported in most parts of Canada and to a less extent westward to Lake Michigan.

TORONTO, CAN.

Cold weather increases demand. Bituminous supply very short and prices high. Transportation delayed by severe weather. Railroads cancel passenger trains to improve freight traffic.

Severe weather has developed a considerable increase in the demand for coal. Supplies of anthracite have been sufficient to meet present requirements, but the shortage of bituminous is still serious and prices higher.

Zero weather has combined with car and labor shortage in delaying transportation. In order to meet the difficulty the railways centering in Toronto have canceled a large number of passenger trains in order to have more locomotives available for freight traffic. Some consignments for Toronto have been confiscated for railway purposes. Quotations for best grades per short ton are as follows: Retail anthracite, egg, stove and nut $9; grate $8.75; pea, $8; bituminous steam $15; slack $14; domestic lump $10; cannel $10. Wholesale f.o.b. cars at destination bituminous three-quarter lump $9, slack $10.

DETROIT

Storms impeding car movement have reduced coal receipts. Demand for steam grades active. Lower temperatures stimulate inquiry for domestic stock.

Bituminous—Users of steam coal are finding the available supply reduced by slower movement due to severe weather. There is an active inquiry and jobbers are having difficulty in meeting the demand. Consumers express a preference for nut, pea and slack, but when unable to get that, are taking larger sizes. The new higher demurrage rules has made jobbers more cautious in bringing coal to Detroit, the result being that there is less coal available for supplying the requirements of factories and industrial plants which depend on frequent renewal of supply. Mine quotations on all sizes of bituminous range from $5.50 to $6.

Low temperatures have created a more pressing demand for domestic coal, though consumers are less urgent than at the opening of the season. While stocks are low, most of the retailers have some domestic sizes on hand. In some of the Detroit suburbs consumers are unable to get coal readily and in Highland Park, a municipally operated yard is attempting to relieve the situation.

Anthracite—Although retail dealers are letting their customers have only a ton or two of anthracite, there are small shipments arriving daily, and it is believed there will be sufficient coal to meet requirements.

Lake Trade—The first contract of the season for moving coal over Lake routes was closed recently; it involves the delivery of 500,000 tons to Superior at 50c. per ton. The same rate applies to Fort William, Ont. On cargoes consigned to ports on Georgian Bay or Lake Michigan the rate is 60c. The rate to Lake Superior ports in 1916 was 30c. While the contract made does not fix the season rate on coal, it has the effect of strengthening the tonnage market. Boat owners, confident that shippers will be unable to move their coal at a lower cost and are refusing offers of 40c. Many vesselmen are unwilling to take contracts until they know what fuel coal is to cost. An average of $1 over the 1916 price is anticipated.

COLUMBUS

A reaction early last week has been succeeded by still higher prices and stronger demand, due to a severe cold wave. Steam consumption heavy.

Warm weather early last week caused a recession in prices of about $1 per ton on most grades. A blizzard, accompanied by snow fall toward the last of the week had the effect of strengthening the trade and restoring prices to former high levels. The market has been fairly good and prospects are for high prices.

The domestic trade has shown the most uncertainty. High temperatures reduced the demand for a time and dealers had an opportunity to catch up on orders. Retailers' stocks are larger, although they are still low, as compared with previous winters. There is a strong demand for the fancy grades, such as Pocahontas, West Virginia splints and White and Red Ash. Rural dealers are buying actively as the demand in country districts is good.

The steam business is also rather active, following a period of lower quotations. Consumption is at a high point as manufacturing is active and railroads are taking a large tonnage for freight movement. Surplus stocks are not large, although some large users were able to accumulate a small reserve during the lull.

Production shows an increase over the records of the previous week, due to the passing of the holidays. The car supply on the Hocking Valley has also been better. It is estimated that the output in the Hocking Valley is 75 per cent. of normal. In eastern Ohio there is still a marked car shortage and production is at a low ebb.

Prices on short tons, f.o.b. mines are as follows:

	Hocking	Pomeroy	Eastern Ohio
Rescreened lump	$4.25	$4.50	
Inch and a quarter	4.25	4.50	$4.50
Three-quarter inch	4.25	4.50	4.50
Nut	4.00	4.50	4.50
Egg	4.00	4.50	
Mine run	4.00	4.25	5.50
Nut, pea and slack	4.00	4.25	4.50
Coarse slack	4.00	4.25	4.50

CINCINNATI

Severe weather and car shortage have stiffened all departments. Prices tending toward higher levels.

Several days of comparatively warm weather lessened the domestic demand early last week, and gave an easier tone to the entire market, but as much colder weather, accompanied by heavy snow on several days, followed immediately, the situation promptly returned to its former condition. This has even been accentuated by reports from Eastern Kentucky that the car situation is worse along the L. & N. than at any time so far this season.

Prices are steady at a high level, with every sign of going still higher very soon. Good grades of bituminous, West Virginia and Eastern Kentucky, are quoted around $3.75@4 for mine-run, per short ton f.o.b. the mine, with nut and slack 25c. higher, on account of the heavy demand for screenings for steam purposes. Smokeless is a little easier, largely on account of the extent to which industrial consumers have resorted to soft coal, mine-run being sold at $4.50@5, with lump at $5@5.50.

LOUISVILLE

Acute car shortage threatened in Eastern Kentucky. Severe cold weather, with heavy snowfall, increasing demand and impeding movement.

After having a practically complete car supply for two weeks, Kentucky mines, especially those in the eastern and southeastern parts of the state, have finished a week with about a 50 per cent. supply and now face prospects of a 33⅓ per cent. supply. A warning that such a condition was inevitable was issued by the Louisville & Nashville R.R. These are the prospects at a time when operators had expected a large output and had felt assured of more than meeting their deliveries. The middle of January saw the arrival of severe winter weather, with a deep fall of snow, both increasing the demand, especial-

ly for domestic sizes, and increasing difficulties of transportation. Western Kentucky is affected by the same weather though not to an equal extent by the shortage of cars.

Prices are showing increasing strength and further advances are looked for. Eastern and Southeastern Kentucky quote, f.o.b. the mines, block $4; mine-run, $3.50@3.75; nut and slack $3.50@4. Premiums are expected within the week. Western Kentucky reports no changes.

BIRMINGHAM, ALA.

Inquiries for both steam and domestic grades strengthened by return of cold weather. Scarcity of equipment again a factor.

After a recession in prices of steam grades amounting to around $1 per net ton in the course of the last few weeks, due to a more liberal car supply and continued warm weather, indications at this time point to no further decline for a while, at least. The spot market in steam and domestic grades during the past week has been fair and brokers express the belief that the demand will shortly stiffen. Quotations are about as follows, f.o.b. mines, per net ton: Big Seam and Carbon Hill mine-run $2.50; Pratt mine-run $3; Black Creek and Cahaba mine-run $3@3.25. Domestic grades, Carbon Hill lump $3.50; Cahaba and Black Creek lump, $4; Montevallo $4.25.

Contracts were made by the Seaboard Air Line with the Alabama Co., for approximately 180,000 tons to be shipped over a period of 18 months, and by the Mobile Electric Co. for 30,000 tons steam coal to be delivered during 1917.

Inability to secure an adequate supply of cars has seriously interfered with some of the operations during the past week, and the situation is expected to become more tense. Officials of the Louisville & Nashville have notified shippers in this district that they anticipate within the next week the most acute shortage that they have yet experienced.

Coke

CONNELLSVILLE

Coke softer and stiffer again. Car and labor shortage. No interest in contracts.

The coke market softened about Thursday of last week but on Saturday began to turn strong again and this week finds a decidedly strong market, particularly for furnace coke. Car supplies proved poorer and poorer last week, while this week there is a labor shortage also, the celebration of the Greek New Year producing a greater effect than did the celebration of the Greek Christmas a week earlier. Spot furnace coke after having been down to $8 or $8.50 a day or two last week has stiffened and is now $9.50 to $10. Contrary to the usual experience, box cars have been more plentiful than hoppers, with the result that foundry coke has not stiffened accordingly and in the past few days good brands have been available at $10, though $10.50 is probably nearer the market today.

There is no further interest manifested in contract coke. Consumers who have not covered will doubtless take chances with the spot market, and contract prices quoted are those indicated by previous transactions. We quote: Spot furnace, $9.50@10; contract, $6@8.50; spot foundry, $10@10.50; contract, $8@8.50, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Jan. 6 at 358,576 tons, and shipments at 354,575 tons, an increase of 28,599 tons.

Buffalo—The supply does not increase and prices are as high as the consumer will pay to avoid shutting down. It does not appear that the consumption of iron and steel is any less of late. In fact builders who naturally use iron are casting about for an acceptable substitute, rather than be idle from lack of material. Quotations are on the basis of $10 or a little more for Connellsville foundry at the ovens, which would make the f.o.b. Buffalo price $11.85, with $9.85 for the lower grades.

Chicago—Furnace coke has sold as high as $15 during the week but with the lifting of embargo by the B. & O. the price dropped back to $13.50. Contract prices for the first quarter of the year are $8.50 to $9 on furnace, while on foundry coke the price asked is $6 to $6.50. But little free stocks of any grades are available at this time. Prices per net ton f.o.b. cars Chicago, are nominally as follows:

Connellsville	$13.00@15.00
Wise County	13.00@15.00
By-Product Foundry	13.50@15.00
By-Product Domestic	11.00@13.50
Gas House	10.00@12.00

Birmingham—Diversion of foundry coke for furnace consumption during the holiday season has somewhat restricted the spot supply, which is quoted at $11 per net ton ovens. Both furnace and foundry grades are in good demand but business booked is very limited on account of the small tonnage available above contract requirements.

Middle Western

GENERAL REVIEW

Severe weather precipitates a critical situation early in the week. Schools closed at Chicago and city officials threaten drastic action. Railroad congestion accentuates difficulties.

Long continued cold and stormy weather found Chicago facing the eminent possibility of an acute coal shortage early in the week. Mayor Thompson at this time was threatening to seize every shipment in the railroad yards in an endeavor to relieve the distress, if the menacing aspects of the situation did not clear up promptly. On Monday some of the high schools were compelled to close their doors on account of the lack of fuel for heating purposes.

All the railroads entering Chicago issued orders that coal traffic was to have the right of way over everything except passenger trains and perishable goods. They were themselves very short of coal, and were in the market for additional supply. The Norfolk & Western R.R. had placed a firm embargo against any fuel shipments west of Columbus, Ind., and no Pocahontas coal of any description was being received. The railroads were also compelling consignees to unload all shipments standing in terminal yards immediately. The Department of Justice instituted an investigation to determine whether brokers were holding up deliveries in order to force higher prices.

Wholesalers and retailers generally report that collections are in good shape. The coal business in the West seems now to be more nearly on a cash basis than ever before. Contracts for steam coal are being discussed. Indications are that the minimum figures for Western screenings on contract renewals will be not less than $1.25, and in many cases 10c. more. If car and labor supply show no improvement before Apr. 1, many operators will reserve their fine coal for sale in the open market. The volume of steam coal moving at the higher figures as compared with the amounts applying against contracts made last spring is relatively small. Western screenings generally sold last year at from 85c. to 90c., against recent prices of $2.25 to $3.75 and a 50 per cent. car supply has not been conducive to the shipment of much free coal.

CHICAGO

Chicago situation critical. Receipts of all Western grades inadequate. Eastern coals still very short. Screenings in strong demand.

Ninety-eight per cent. of the tonnage produced in Franklin County is now within the fold of the Franklin County Coal Operators Association, the only company not a member being the Middle Fork Mining Co.—a subsidiary of the United States Steel Corporation. From April to December, 1916, Franklin County mines produced 7,165,752 tons, a gain of 722,089 tons over the same period of the previous year. Franklin County lump has averaged $3.75 during the week with chestnut, pea and mine-run from $3 to $3.50, and screenings the same. Williamson County prices have not varied considerably from the foregoing.

Running time at the southern Illinois mines has improved, some of them operating to 90 per cent. of their capacity. This enables many mines to make headway in filling back orders on their books. When the cold wave arrived on Thursday, an influx of orders occurred which caused prices to go up rapidly.

Central Illinois domestic sizes have slumped off rather badly, but steam coals retain their strength. Peoria and Fulton County mines worked full time, and prices changed but little.

More free coal has been available from the Indiana mines during the week than from any other section. The cold wave toward the close of last week, found a considerable quantity of free tonnage in transit ready to be sold at higher prices. The demand for Indiana steam coal continues strong, and mine-run and screenings are now steadily held at $3.50.

Quotations in the Chicago market before the situation became so acute, were as follows, per net ton f.o.b. cars at mines:

	Springfield	Fulton & Peoria Cos.	Clinton & Sullivan Cos.	Green & Knox Cos.	Carterville
Domestic lump	$3.00@3.50	$3.00@3.75	$3.00@3.50	$3.00@3.50	$3.75@4.00
Steam lump	3.00@3.50	3.00@3.50	2.75@3.50	.....	.....
Egg	3.00@3.50	3.00@3.50	3.00@3.50	3.00@3.50	3.75@4.00
Nut	3.00@3.50	2.50@3.00	2.75@3.25	.....	.....
Mine-run	3.00@3.50	2.75@3.25	3.00@3.50	2.75@3.50	3.50@4.00
Screenings	2.75@3.50	2.75@3.25	2.75@3.50	2.75@3.50	3.50@3.75

	Wilmson. & Franklin. Cos.	Saline & Harrisburg	Poca. & W. Va. Smokeless	Penna. Smokeless	Eastern Kentucky
Lump	$3.50@4.00	$3.50@4.00	$4.75@5.25		$3.75@4.50
Egg	3.50@4.00	3.50@4.00	4.75@5.25		3.50@4.50
Nut	3.50@4.00	3.00@3.50	.....		3.00@4.00
No. 1 nut	3.50@4.00	.....	.....		.....
No. 2 nut	3.00@3.50	.....	.....		.....
No. 3 nut	3.00@3.50	.....	.....		.....
No. 1 washed	3.50@4.00	.....	.....		.....
No. 2 washed	3.00@3.75	.....	.....		.....
Mine-run	3.00@3.50	3.50@4.00	4.25@4.75		3.00@4.00
Screenings	3.00@3.50	3.25@3.75	.....		.....

None arriving

Hocking Lump $3.75@4.00. Splint Lump $3.75@4.00.

Much interest is evinced in the prices to be paid under contract for smokeless coal in the West. Prices asked are $3 for mine-run up to Aug. 1, and $3.25 thereafter. Lump and egg are quoted at $3.75 for April delivery, quotations being subject to revision after May 1. These prices are high due to the heavy demand in the East. The demand in the West has been easier owing to warm weather.

Hocking and splint were strengthened materially when lower temperatures arrived. Kentucky coals have shown a wide range of quotations, prices on lump and egg averaging from $3.50 to $4.50.

Anthracite at circular prices continues to be sold as rapidly as it arrives. Shipments have been interfered with by embargoes and movement on some roads has been slow. The docks are empty, and all-rail supply fails to meet requirements.

ST. LOUIS

Colder weather stimulates market. Chicago again drawing heavily on St. Louis supplies. Local steam market strong. Higher prices probable. Car supply irregular.

Colder weather stiffened up the market and there has been an unusual demand from Chicago and the North. There is, moreover, a local demand which will continue as cold weather progresses.

The Standard market dropped as much as 50c. a ton during the slump, but it is recovering rapidly and if cold weather continues, there is no limit to the price that this coal may go to. There has been considerable railroad business placed in the past week for mine run in the Standard district at prices ranging from $2 to $2.50, the railroads furnishing their own equipment. The demand for steam sizes has been fairly good locally.

In the Williamson and Franklin field the slump was not so decided, although in a few instances a little coal was sold for as low as $3 at the mine, but the bottom of the market was $3.25. This has improved by 25c. a ton in the last few days and the country business has started to come in again. Considerable railroad tonnage has been placed recently in this territory but not as much as went to the Standard field.

Anthracite moved freely this week, and there was a slight tonnage of smokeless but it was insignificant as compared with the demand. By-product coke continues to move in from Alabama, Indiana and Ohio points and is supplanting anthracite.

Local retail conditions changed slightly for a few days, in the past week. Standard being cut from $4.50 to $4 during the warm weather, but it has gone back again to $4.50, while Mt. Olive is retailing at $4.75 and Williamson & Franklin about $5. Country prices continue to average anywhere from 25c. to 50c. a ton over the St. Louis price.

The car supply for the past week was rather uncertain on all lines, but the B. & O., which has had an exceptionally good supply all season, went down. On all other roads there was an actual shortage of equipment more than was to be expected in view of the weather conditions.

The following is the St. Louis market per net ton f.o.b. mines:

	Williamson and Franklin Co.	Mt. Olive and Staunton	Standard
6-in. lump	$3.25@3.50	$3.00@3.25	$2.50@2.75
3x6-in. egg	3.25@3.50	3.00@3.25	2.50@2.75
2x3-in. nut	3.25@3.50	3.00@3.25	2.50@2.75
No. 2 nut	3.25@3.50	.....	2.25@2.50
No. 3 nut	3.25@3.50	.....	2.25@2.50
No. 4 nut	3.25	.....	.....
No. 5 nut	3.00@3.25	.....	.....
2-in. screen	3.00@3.25	.....	2.25@2.50
2-in. lump	.....	.....	2.25@2.50
3-in. lump	.....	3.00@3.25	2.25@2.50
Steam egg	.....	3.00@3.25	2.25@2.50
Mine run	3.00@3.25	3.00@3.25	2.25@2.50
Washed			
No. 1	3.25@3.50	3.50	.....
No. 2	3.25@3.50	3.25@3.50	.....
No. 3	3.25@3.50	3.25@3.50	.....
No. 4	3.25	3.00	.....
No. 5	3.00	2.75	.....

Williamson & Franklin County rate 72½c. Other fields, 57½c.

General Statistics

CINCINNATI

Receipts and shipments of coal and coke at Cincinnati for 1916, as compared with 1915, were as follows, in short tons according to the records of the Chamber of Commerce:

	Receipts		Shipments	
	1916	1915	1916	1915
Bituminous, rail and river	18,499,855	17,801,777	15,013,821	11,827,780
River	660,624	3,120,252	197,624	287,660
Anthracite	6,352	6,916	8,163	4,670
Coke	272,188	96,074	139,020	48,734

EXPORTS BY DISTRICTS

Exports of domestic coal and coke from the United States and bunker coal laden on vessels engaged in the foreign trade, at the specified districts, during the month of November, 1916, were as follows:

Districts	Anthracite	Bituminous	Coke
Maine and New Hampshire	140	.....	.....
Vermont	549	1,534	.....
Massachusetts	151	10	.....
St. Lawrence	99,038	74,949	1,038
Rochester	44,544	117,456	1,260
Buffalo	151,134	189,845	26,205
New York	7,751	1,934	1,957
Philadelphia	9,382	54,849	623
Maryland	.....	48,723	10,561
Virginia	.....	301,662	1,657
Mobile	.....	40	.....
New Orleans	15	1,179	243
Laredo	.....	2,781	580
El Paso	1	2,856	.....
Eagle Pass	.....	893	1,069
Arizona	.....	3,598	12,489
Southern California	24	1	.....
San Francisco	.....	112	1,632
Washington	.....	2,439	3,852
Alaska	.....	3	.....
Montana & Idaho	.....	1	.....
Dakota	946	3,816	2,176
Duluth and Superior	672	5,438	96
Michigan	11	60,049	6,333
Ohio	8,222	455,735	20,284
Porto Rico	.....	1	.....
Total	322,580	1,329,904	92,055

Bunker Coal	Gross Tons
Maryland	25,815
New York	260,345
Philadelphia	32,624
Virginia	170,099

ANTHRACITE SHIPMENTS

The shipments of anthracite in December, 1916, amounted to 5,582,747 tons, as compared with 5,992, 997 tons in the preceding month and with 6,149,387 tons in December, 1915. The total shipments for 1916, which do not include any coal picked up and sent to market from the storage yards, amounted to 67,376,364 tons as compared with 67,883,776 tons in 1915, the decrease in shipments in 1916 amounting to 507,412 tons.

The decrease in shipments of bituminous coal in December, 1916, compared with November, 1916, was 1.2%, and compared with December, 1915, was 9.2%. The average number of cars of coal per working day was 19,526 in December, 1916, against 20,596 in November, 1916, and 20,679 cars in December, 1915. The 56 roads contributing to this total originated approximately 65% of the total shipments of bituminous coal on railroads in 1915.

The shipments of beehive coke in December, 1916, showed a decrease of 7% compared with November, 1916, and a decrease of 8% compared with December, 1915.

MIDDLE WESTERN ROADS

The following is a comparative statement of coal handled by 17 principal Middle Western carriers for the month of September, and the first nine months of 1915 and 1916:

	September		9 Months	
	1915	1916	1915	1916
Illinois Central	785,514	903,822	5,419,304	6,872,045
C. & E. I. R.R.	656,194	603,817	4,406,804	5,236,787
C. B. & Q. R.R.	645,614	794,677	3,964,916	4,899,322
C. C. C. & St. L. R.R.	488,694	399,893	3,640,023	3,799,703
Vandalia R.R.	430,638	383,891	3,503,483	3,694,433
C. T. H. & S. E. Ry.	258,569	362,459	2,192,758	2,775,202
C. & A. Ry.	189,029	203,683	1,391,515	1,776,101
Wabash R.R.	146,595	165,989	1,135,716	1,189,368
St. L. I. M. & S. Ry.	169,047	185,229	1,145,776	1,353,217
Southern Ry.	127,633	138,093	732,923	1,352,886
B. O. S. & W. R.R.	93,110	80,302	716,641	565,661
St. L. T. & E. R.R.	52,908	108,775	438,571	637,148
St. L. & O. F. Ry.	54,560	74,257	455,102	536,352
L. & M. Ry.	42,835	69,342	342,635	949,926
C. I. & L. Ry.	61,866	58,589	487,943	562,846
C. P. & St. L. Ry.	44,761	41,154	304,835	357,098
C. & N. W. Ry.	33,407	41,751	296,311	376,180

NORFOLK & WESTERN

Destination of shipments over this road for November and the first eleven months of last year and this year were as follows, in short tons:

	November		Eleven Months	
Coal	1915	1916	1915	1916
Tidewater				
Foreign	215,625	163,605	3,642,104	3,153,960
Coa'w'se	275,055	189,635	2,948,970	3,145,331
Dom'tic	2,245,446	2,466,767	20,842,982	25,556,505
Coke				
Foreign	7,082	1,855	34,673	46,641
Domestic	104,118	177,088	834,934	1,827,925
Total	2,847,326	2,998,950	28,303,663	33,730,162

	Domestic Sizes				Total			
	December		Year		December		Year	
	1916	1915	1916	1915	1916	1915	1916	1915
Phila. & Reading	890,839	984,256	11,013,112	10,006,603	1,040,643	1,129,504	12,842,731	11,488,444
Lehigh Valley	860,848	923,172	10,666,855	11,577,460	964,007	1,028,421	12,056,078	12,932,526
Cen. R.R. of N. J.	502,237	582,260	5,860,746	6,531,102	600,254	722,982	7,135,544	8,017,816
D. L. & W. R.R.	822,819	775,064	9,050,917	8,013,938	953,565	927,864	10,638,500	9,579,053
Dela. & Hud. Co.	493,327	536,620	5,927,562	6,777,622	591,874	650,999	7,095,297	8,016,988
Pennsylvania	391,508	550,954	5,079,007	5,206,686	449,052	637,445	5,841,475	6,124,596
Erie R.R.	549,795	565,120	6,675,363	6,642,631	634,190	652,505	7,718,089	7,874,062
N. Y., O. & W.	132,138	168,012	1,677,807	1,863,182	147,007	190,124	1,945,030	2,088,577
Lehigh & N. E. R.R.	216,662	.....	2,168,367	.....	275,329	.....	2,653,964	.....
Total	4,860,173	190,591	58,119,736	1,568,540	5,655,921	209,543	67,926,708	1,761,714
* Deduction	41,069		319,728		73,174		550,344	
Total	4,819,104	5,276,049	57,800,008	58,187,764	5,582,747	6,149,387	67,376,364	67,883,776

* Deduction: Tonnage reported by both C. R.R. of N. J. and L. & N. E. R.R.

COAL SHIPMENTS

The following statement of carloads of bituminous coal that originated on 56 railroads and of beehive coke on 11 roads in December, 1916, is compiled from reports received by the Geological Survey, Department of the Interior, by noon, Jan. 15, 1917:

	December, 1916	November, 1916	December 1915
Number of working days	25	24	26
Carloads of bituminous coal (56 roads)	488,156	494,312	537,647
Carloads of beehive coke (11 roads)	61,880	66,619	67,480

These are comparative figures based on reports for December, 1916, distributed as follows: 31 roads in Eastern classification territory (including Illinois). 12 roads in Southern classification territory. 13 roads in Western classification territory.

I. C. C. Decisions

Investigation and Suspension Docket No. 800. Coal from Pennsylvania Mines. No. 8694. Ford Collieries Co. vs. Bessemer & Lake Erie Railroad. Submitted Oct. 5, 1916. Decided Dec. 5, 1916.

Increased rates on bituminous and cannel coal in carloads from group 2 points in the Freeport district of Pennsylvania on the line of the Bessemer & Lake Erie Railroad Company to destinations in eastern New York, New England, and the province of Quebec, Canada, found to be properly aligned with rates on similar coal from neighboring mines on other lines of railroad to the same destinations. Complaint dismissed and orders of suspension vacated.

No. 8289. Alliance Coal and Coke Co. vs. Colorado & Southern Ry. Submitted Feb. 5, 1916. Decided Dec. 12, 1916.

Rates on nut coal from the Walsenburg district in Colorado to points on the Atchison, Topeka & Santa Fe Ry. in Kansas found to be unjustly discriminatory to the extent they exceed by more than 10c. per ton the rates contemporaneously maintained from the Cañon City, Colo., district to the same distinations. Proper relationship prescribed.

No. 6593. Stevens Grocer Co. vs. St. Louis, Iron Mountain & Southern Ry. Submitted June 10, 1916. Decided Dec. 12, 1916.

Upon complaint alleging that the through rates charged to Parkin and Wynne, Ark., on certain carloads of coal from points in Kentucky, Maryland and Alabama, by way of Memphis, Tenn., and that the local rates from Memphis to the same points were unjust and unreasonable the factors of the through rates beyond Memphis and the local rates from Memphis being attacked, and the complaint naming no defendant other than the delivering carrier operating from Memphis to destinations, held:

1. Where a through rate is alleged to be unreasonable all the carriers which participate or participated therein should be named as defendants.

2. A through rate is a transportation unit, although its factors or component parts may be separately established; and being a unit its parts as such may not be attacked unless the through rate itself is also attacked; nevertheless certain rates, such as local rates, or joint rates, which may be used as parts of through rates may be attacked as applicable to local shipments.

3. Upon this record the commission will consider only local rates from Memphis to Parkin and Wynne, and such shipments as moved from Memphis to Wynne upon a local rate.

4. Local rates on coal in carloads from Memphis to Parkin and Wynne found to have been and to be unreasonable. Reasonable maximum rates prescribed for the future and reparation awarded on certain shipments from Memphis to Wynne.

Investigation and Suspension Docket No. 871. Demurrage. Submitted Sept. 20, 1916. Decided Nov. 25, 1916.

A proposed rule of the New York, New Haven & Hartford Railroad and affiliated lines provides that, when cars are held in transit short of billed destination or on storage tracks at destination because of the failure of consignees to unload within the free time cars placed for delivery, the published demurrage charges will apply on the cars so held and no additional free time will be allowed after final placement; Held, That the proposed rule has not been justified.

No. 8589. Wattles-Fisher Coal Co. vs. Ann Arbor Railroad. Submitted Apr. 13, 1916. Decided Nov. 25, 1916.

Demurrage charges, due to inadvertent cancellation of free time provision, collected on coal in carloads, held for reconsignment to Frankfort, Mich., found to have been unreasonable

Foreign Markets

GREAT BRITAIN

Dec. 28—The scarcity of coal existing last week has been accentuated by the cessation of work over the Christmas holidays. Prices rule firmer, although the demand is small.

Best Welsh steam	Nominal
Best seconds	Nominal
Seconds	$7.20@7.44
Best dry coals	6.72@6.96
Best Monmouthshires	6.72@6.96
Seconds	6.24@6.48
Best Cardiff smalls	4.80@5.04
Cargo smalls	4.32@4.56

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—The freight market about maintains its level. If, however, the scarcity of coal continues, lower rates may be looked for.

Gibraltar	$11.40	Port Said	$19.20
Marseilles	14.04*	Las Palmas	9.60
Genoa	14.28*	St. Vincent	10.20
Naples	13.80*	River Plate	12.60
Alexandria	19.80		

TRANSVAAL

Coal sold at the Transvaal mines for the 9 months of 1915-16 compares as follows, in long tons:

Month	1916	1915
January	435,548	368,295
February	470,946	319,670
March	495,100	414,687
April	474,761	427,413
May	538,910	449,205
June	503,840	484,301
July	489,760	506,463
August	528,679	493,424
September	548,353	448,285
Totals	4,485,897	3,911,743